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THE NATURALIST;

ILLUSTRATIVE OF THE

Animal, Vegetable, and Mineral Kingdoms,

(TO BE CONTINUED MONTHLY),

WITH ENGRAVINGS BY EMINENT ARTISTS.

"Nothing can be unworthy of being investigated by Man which was thought worthy of being created by God."—BOYLE.

EDITED

BY NEVILLE WOOD, ESQ.

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TO

JOHN WALBANKE CHILDERS, ESQ., M.P.,

Of Cantley Hall, in the West Riding of Yorkshire,

AS A SLIGHT RETURN

FOR THE KIND MANNER IN WHICH HE HAS EVER PROVED HIMSELF READY TO

ADVANCE THE INTERESTS OF THIS JOURNAL,

The Third Volume

IS INSCRIBED,

BY HIS SINCERELY-OBLIGED FRIEND,

THE EDITOR.

6

THE NATURALIST.

REMARKS ON THE NATURAL HISTORY, SCENERY, AND MANNERS OF NEW ZEALAND.

By Thomas Kier Short, Esq.

It is with great pleasure that I perceive you have introduced some papers on foreign Natural History in your valuable work, *The Naturalist.* In the first place, I consider it a great acquisition to your periodical, as it will doubtless induce many to purchase it who would not be satisfied with articles treating exclusively of the natural productions of our own country. In the second place, it is opening a channel for many who cannot procure more expensive works. But to enter upon my subject without further preface.

It has been my lot to be one of the few who have circumnavigated the globe, and to have visited its four quarters in pursuit of Natural History. The subject of my present essay is New Zealand, and, if it is considered worthy of insertion in *The Naturalist,* it shall be followed by others, on Vandieman's Land, South America, and the Brazils.

I left Launceston, Vandieman's Land, for New Zealand, in the brig Brazil Packet, March 26, 1836, and first made land at day-break on the 5th of April. We entered the mouth of the river Hookeangah at nine o'clock, a. m., and dropped anchor at noon of the same day.

New Zealand is situated between 34 and 47 degrees south latitude, and from 166 to about 180 east longitude. It was first discovered by Tasman, in 1642. In 1770 the coast was explored by Captain Cooke, who sailed between the two large islands, and gave the name "Cooke's Strait" to the channel. New Zealand forms the southern boundary of Polynesia, and comprises two large and several small islands. The appearance of the coast is bold and rocky, the land is high and rugged; and the southern mountains are occasionally covered with snow.

In the large northern island, where the principal if not the only settlements of Europeans are situated, the climate is salubrious, the thermometer ranging between 40 and 80 degrees, avoiding the heat of a tropical climate, yet warmer than most temperate latitudes, generally equable, and seldom experiencing those sudden vicissitudes so frequent and injurious in the variable climate of England. The soil is in many parts fertile, and though possessing few indigenous articles of food, yet these, when once introduced, grow spontaneously.

Thunder-storms are frequent and violent in New Zealand, particularly in the winter months, when they are generally attended by torrents of rain. The

waterfalls and forests of New Zealand—especially the latter—are well worthy of notice.

Before I enter upon a more minute description of the natural productions of the country, I shall conduct the reader from the heads of the river Hookyarga to the Wesleyan Mission station, Mungung, through some of the most delightful scenery in the world. The appearance of the country is not, at first sight, very interesting to the naturalist. The north head is composed of a barren sand-hill in a conical form, being an excellent mark for vessels entering the river; it is destitute of all vegetation, and is of a whitish colour; whilst that of the south is composed of high broken hills. The barren rocks appear through in many places, and are clothed with verdure to their summits, the foliage being of a remarkably light green colour, which contrasted well with the sombre appearance of the dark basaltic rocks. The whole island bears very strong marks of volcanic agency.

On the south head an English sailor has built a small house, and hoists signals to denote whether it is safe to cross the bar at the mouth of the river. The river at the north is about three miles broad, and does not decrease in breadth for about four miles from the heads, when we come to the first native village or settlement, called Parkani, where the chief of the heads resides, who came on board as soon as the vessel passed the village. He was a fine, tall, good-looking man for a New-Zealander, with his face, arms, and thighs much tattooed. The only covering he wore was a large green blanket, in which he was enveloped. He brought a present of Water-melons, Figs, Maize (or Indian Corn), and Peaches. The Peaches differed from any I have yet seen, being of a yellowish colour, and possessing more of the flavour of *Prunus Armeniaca* than of *Amygdalus*. A little above Parkani the river takes a slight turn to the left; the first European settlement is situated on the right bank, on a small isolated point of land called "one tree point." At this part of the river the banks are steep, being composed of a soft sinuous rock, which is much perforated by a species of *Pholas*, but as I could not obtain a perfect specimen, I was unable to distinguish the species. The banks above high-water mark were covered with a profusion of Ferns, among which I found *Polypodium scandens* and *P. pustulatum*, growing among large bushes of *Leptospermum scoparium*, which was in full flower.

Somewhat above the point is a small rock or island cut into terraces, and which was used by the natives as a place of defence previous to the introduction of fire-arms. It is now covered with a profusion of *Anthropodium cirratum*, and a small species of *Pimelea*, which I took for *P. filamentosa*.

The country becomes more interesting the further we proceed up the river, which is now about one mile broad, the forest for the first time coming to the water's edge, which, from its luxuriant appearance, induced me to land. After

passing through a thick flat of *Phormyum tenax* (New-Zealand Flax) four feet high, we entered a dense forest, in which all the trees and plants were new, with the exception of *Fuchsia excorticata.* The first thing that strikes the traveller is *Damara Australis* (Kowdy tree), commonly called the New-Zealand Pine, which often rises to the height of a hundred feet before it gives out branches, looking more like works of art than of Nature. It has a fine smooth bark, and is perhaps the only tree not infested by parasitic plants. In company with *Damara Australis* are generally found *Dacrydium cupressum*, *D. plumosum*, *Vitex littoralis*, *Melicytis ramiflorus*, and *Taxus matai.* The Palm and Fern trees were of large dimensions, which, as well as other trees, were covered with a variety of epiphytes and parasites, which imparted to them a beauty not their own; whilst the ground was covered with a profusion of *Filices*, *Musci*, and *Fungi*, of the most varied forms and colours, the whole of which were quite new to me. The numerous decayed trees and vegetable matter, the density of the foliage impervious to the sun's rays, caused a cool damp atmosphere so congenial to the growth of the lower orders of vegetation.

The Ornithology of New Zealand—or at least of this part of it—seems scanty, as the only birds I saw in my course up the river were a few Cormorants, small ash-coloured Herons, a little Bittern, and a black bird the size of a Starling, having a small plume of white feathers under its chin, somewhat similar to a clergyman's bands. Higher up the river again expands to about two miles broad, but is very shallow; the stones on the banks are curious, most of them being spherical, and, piled upon each other in grand confusion, recall to the mind of the romantic traveller the wars of the Tartars. They are composed of a species of basalt.

The traveller, still ascending, arrives at a very confined part of the river called "the Narrows," the river suddenly contracting from two miles wide to one-fourth of a mile, the banks being high and steep, and the water rapid. Here we had to stand waiting the return of the tide. On the banks I gathered *Adeantum trigonum*, *Pteris rotundifolia*, and *Asplenium bulbiferum.* The distant mountains now appear up the valleys, which, from the natives continually setting fire to the woods, have a light blue shade, looking as if in a continual smoke. Above the Narrows the muddy banks of the river are covered with a species of Mangrove. The tourist now comes in sight of the Wesleyan Mission station, situated on the right bank of the river, where the rivers Monomoka and Whioa fall into the Hookeangah. I spent some weeks there, and found in their garden fine trees of Peaches, Apples, Figs, Plums, White Mulberries, *Agara Americana*, *Arracaria excelsa*, Coffee, *Psedium piriferum*, Oranges, Lemons (in fruit), Vines, Gooseberries, Currants, Strawberries, and other vegetables.

In my next paper I intend to conduct your readers through the mountain-passes to the bay of Islands, through scenery which it is almost impossible to describe so as to do justice to its beauty.

Martin Hall, Nottinghamshire,
November 30, 1837.

LIST OF DIURNAL LEPIDOPTERA CAPTURED IN THE NEIGHBOURHOOD OF ST. ANDREWS IN 1837.

WITH OBSERVATIONS, ETC.

BY HENRY BUIST.

HAVING been a constant reader of your valuable and useful magazine, *The Naturalist*, since its commencement, I assure you I have derived great pleasure as well as obtained much useful information from the perusal of the contents of your monthly numbers as they appear, and always look forward with great pleasure to the beginning of each month when *The Naturalist* arrives, I have sent you the following list of Diurnal *Lepidoptera* taken by me this season in the neighbourhood of St. Andrews, with observations on their time of appearance, &c., hoping that it may prove interesting to at least a few of your numerous readers, as it gives an idea of what Papilios they may expect to find in this district.

The Butterflies enumerated in the following short list were all taken by myself this season, none of them at a greater distance than two miles from the city of St. Andrews, which is situated on the East coast of Fifeshire, on a small bay called St. Andrew's Bay. The climate here is particularly pure and healthy, owing no doubt to its position with regard to the sea and adjacent country. The weather, however, is generally cold and disagreeable in spring, on account of the North-East winds generally prevailing during the months of April and May, and bringing with them cold unpleasant vapours which load the air and check vegetation. Epidemic or contagious diseases are hardly ever known here, but the climate is thought to be too sharp and penetrating for rheumatic constitutions, or those who are threatened with consumptive complaints. The latitude of St. Andrews is 56° 19′ 33″ north, true to a second, and the longitude 2° 50′ west from Greenwich. The medium temperature of the air at St. Andrews was found by the late Dr. JACKSON, Professor of Natural Philosophy here, from eight years observation, to be 43° 374′ of FAHRENHEIT. A small stream called the Kinnes burn skirts the town on the South, on the banks of which stream I have

taken most of the insects mentioned below. On the N.W. side of the town are the links, which run north for about ten miles, till they reach the mouth of the river Eden. Here I have taken many insects. In the month of July this year the beautiful blue *Polyommatus Alexis* was particularly abundant, and here also, on the 18th of the same month, I saw a specimen of *Macroglossa stellatarum*. The only museum of Natural History here is that in the United College buildings, the specimens in which, however, are fast going to decay from want of attention. A few years ago a course of lectures on Natural History was delivered in the University, but, owing to the small number of students that attended, I am sorry to say it was given up.

Pontia brassicæ	Hipparchia megæra
——— rapæ	——— janira
——— napi	——— hyperanthus
Vanessa urticæ	Lycæna phlæas
——— io	Polyommatus alexis
——— atalanta	

Pontia brassicæ.—This Butterfly, although common here, is by no means so plentiful as the two following, owing, I suppose, to the immense number of caterpillars which are destroyed by the larvæ of a small Ichneumon. Of twelve caterpillars which I fed this year only one changed into a chrysalis; all the others were destroyed by these larvæ, which, when full grown, make their way through the body of the caterpillar, and spin for themselves beautiful little yellow cocoons. The caterpillar above mentioned is the only one that changed into a chrysalis after having fastened the band for the suspension of the future pupa, fell to the bottom of the box, and there changed itself into a chrysalis. The last time I saw this Butterfly this season was on the 18th of October.

Pontia rapæ and *P. napi*, with varieties of both, common.

Vanessa urticæ.—I saw it for the first time this year on the 2nd of May; last year I noticed a single specimen as early as the 18th of March, another on the 4th of April, and several on the 15th of April, after which time it was abundant; this year it was not seen in any abundance till the 2nd week of May. The last specimen I saw this year was on the 19th of October; last year I observed one as late as the middle of December.

Vanessa io.—On the 3rd of October, which was a dull damp day, when out in the garden with a spade in my hand, digging up a weed from a bed of China Asters then in flower, I was so fortunate as to disturb what I thought to be a specimen of *V. urticæ*, which flew off a short distance, and alighted on the ground. But what was my surprise and delight when on seizing it by the thorax with my fore-finger and thumb—which caused its wings to open a little—I found it was what our earliest British entomologists named "*omnium regina*," *Vanessa Io*. It has been stated that this beautiful insect—of which my speci-

men is a very perfect one—"probably does not extend beyond the Frith of Forth," and this is the only recorded instance that I know of its having been seen or taken on this side of the Forth.

Vanessa atalanta.—I have only seen one specimen of the Red Admiral here, which was on the 18th and 19th of October. It is a very active insect, never resting long on one spot. On the 18th it alighted several times close beside me on the ground, on flowers, on the trunks of trees, &c., in the garden, but was so active that I could not catch him. He at last flew out of the garden, and did not again return that day. On the 19th I again found him in the garden, when I secured him for my cabinet.

Hipparchia megæra.—This insect is extremely abundant here, especially during August and September, before and after which month it is not so abundant. The first specimen I saw this year was on the 3rd of June, and the last on the 19th of October. The last time I saw it in 1836 was on the 18th of October. I have taken specimens with 2 small ocelli, besides the large one on the under side of the anterior wing.

Hipparchia janira.—Very abundant in the month of August, at the side of the Kinnes burn, and flying over corn-fields.

Hipparchia hyperanthus.—Not very abundant here. But I saw and took it in great abundance about 16 miles west from this in the parish of Abdie on the 10th of July, flying in a meadow, over the long grass.

Lycæna phlæas.—I have had great difficulty in procuring a perfect specimen of this beautiful and active little Papilio (which is very abundant on the banks of the Kinnes burn in August and beginning of September), owing, I suppose, to its pugnacious habits, of which I had an example on the 24th of August. A bold little fellow seemed to think himself the sovereign of a head of flowers of the Common Ragwort (which they delight to settle upon), over which he kept constant watch, offering instant battle to any other insect that attempted to alight within his dominions. Whilst I watched him he beat off others of his own species, as well as *Polyommatus alexis* and *Hipparchia megæra.* The specimens I have taken of this little Butterfly vary in the intensity of copper, as well as as of the dark colour, and on the 14th of September I caught three specimens of a variety with 4 blue spots on the dark part of the posterior wing, which spots are encircled by a zone of a golden colour.

Polyommatus alexis.—As stated above, this insect was very abundant on the links about the end of July. I have also taken specimens at the burn and in the garden.

Law Park, near St. Andrews,
November 13, 1837.

AN ACCOUNT OF A YOUNG CUCKOO.

By W. H. Benshed.

In the month of July, 1834, I had a young Cuckoo given to me by a man who was working in a stone-quarry. It was caught in its attempt to fly from the nest of a pair of Wagtails built in a cleft in the rock. The man had confined the young bird under a sieve, and informed me that the old birds had fed it during the day. My residence being but a short distance from the quarry, I took an old Bee-hive, and putting some net over the bottom, I placed the young bird into it, and, fixing three Hop-poles in a triangle upon the lawn, set the hive upon its side, in the top part, and watched the result. In a few minutes I heard a low chirping note from the Cuckoo, and directly afterwards I saw the two Wagtails settle upon the lawn. Delight and joy really appeared in all their actions; they rushed to and fro in the air, flying about the hive, and hovering near it, with a graceful undulating motion, the Cuckoo crying more eagerly for food as they darted past, or hung fluttering in the air.

I could not, moreover, help noticing the actions of several other birds. A brood of young Swallows flew from the chimney-top as the old ones gave their peculiar note, or cry of warning of danger, which is heard when a Cat or Hawk makes its appearance. A Wren flew to the hive, and seemed to eye its inmate with some curiosity, but a bold, pugnacious Robin shewed such a disposition for fighting that the cock Wagtail boldly attacked and drove him away.

The hen had now procured some food, which appeared to consist of small Butterflies and caterpillars, but the nest seemed to excite her suspicions; she evidently feared being entangled with it. I then put a twig for a perch, and she soon settled upon it, and gave the young Cuckoo its food. The two old birds continued to feed it regularly for about a week, when their attention seemed to be less constant, and, fearing it would be starved, I set it at liberty, but frequently saw it until the end of August, sitting upon the end of a Hop-pole, and still attended by the Wagtails.

The Rev. Gilbert White, in his *Natural History of Selborne*, has taken notice of the instinct of the Cuckoo, in selecting the nest of a soft-billed bird with whom to entrust her young. Without this precaution, it would seem to be a total contradiction to the general feeling and impulse of Nature, and there can be no doubt of the care and forethought of the Cuckoo, in thus selecting the nest of birds which will provide food suitable for her young; and an extraordinary instinct is given to the young Cuckoo, to destroy its helpless companions by thrusting them out of the nest, beneath which they perish, thereby receiving the undivided attendance of the old birds, as it is most probable they would not be able to rear so large a bird and their own young too, particularly as the Cuckoo

leaves this country early in the summer; I have imagined that on account of the shortness of the time which the Cuckoo spends in this country, it would not be able to rear its own young, and hence the economy of leaving the egg in the nest of another bird.

In my school-boy days I once put five young Starlings, which I had taken from a hole in a tree, into the nest of another pair of Starlings, which had built in a Pigeon-cove and had four young ones. The nine birds were reared, but the chirping was incessant, and the labour of the old birds very great.

The greatest boldness I ever witnessed in a parent bird was shewn by a hen Partridge, which, on being surprised with her young covey, dashed like the domestic hen at a spaniel, and fairly drove the Dog away, and who came cowering to my heels. The beautiful bird, fired by her maternal feelings, came to within a few yards of me, and then flew away to her mate, who had decoyed her young away into safety. What a contrast this appears to the actions of the Cuckoo! but the laws of Nature are as unerring in the actions of each for the propagation of their species, and the instinct that teaches the Ostrich to leave her eggs in the sand, is as all-sufficient as the instinct that causes the Tomtit to build so warm and close a nest that all the heat of her little body may be retained for her eggs.

Maidstone, Nov. 1837.

HABITS OF THE NATTERJACK (*Rana rubetra*, Linn.)

By R. Tudor, Esq.

Dear Sir,—I have received the following very interesting communication respecting the habits of the Natterjack, from R. Tudor, Esq., of Bootle (an accurate and intelligent naturalist), which, if you think worthy of being inserted in your magazine, you are at liberty to publish.

Being an observer of this curious and interesting animal, I beg leave to forward to you a few particulars relative to its habits. The Natterjack is a reptile intermediate between the Frog and the Toad, and is found in great abundance at Bootle. Turton's description of the animal is, "Body about two inches and a quarter long, tubercled, one inch and a quarter broad, above of a dirty yellow clouded with brown, beneath paler with black spots, back with a yellow line; fore feet four-toed; hind feet five-toed and a little webbed." Its time of spawning is much later in the spring than that of the Common Frog, being about the latter end of April. It is singular to observe the impregnated eggs strewed about the shore after expulsion, in clusters bearing a great resemblance to strings of black beads, extending many yards in length, and convoluted in every possible

direction. The parts of the shore selected for that purpose are very much saturated with moisture from fresh water exuding from the high land above, and in spots also where this water forms shallow accumulations. During the expulsion of the spawn the male reptile is placed upon the back of the female, securely fixed, and impregnates the spawn as it passes from her (no previous union of the sexes having taken place), both animals moving at a moderate speed at the same time, thereby causing the great length of the chain of spawn. The male at this season is provided with a tubercle, or black warty excrescence on the inner side of each thumb, for the purpose of giving him a more secure hold of the female (accounting for the very vulgar and mistaken notion commonly entertained, that the one year Frogs ride upon the backs of the three year Frogs until they are killed). After a short time the tadpoles make their appearance, but they are much smaller than those of the Common Frog, and remain in the water until their metamorphosis is completed, which is generally in the course of a few weeks. During this period a constant croaking is kept up by the male, which is very different from that made by the Common Frog, and which may be heard at a distance of at least five hundred yards; this is continued till the season is far advanced, and particularly on serene quiet evenings, and before a change of weather; it is a peculiar kind of harsh croak, not altogether unpleasant. After the change to the perfect animal takes place, the young leave the water and seek protection on the land. At first they confine themselves to rather moist situations, then gradually retire to more dry and gravelly spots, and are found in clusters of fifty or sixty in a place, generally under tufts of grass, so closely impacted together, that it is with great difficulty they can separate themselves. After some time they become stronger, and seek a retired and more solitary situation inland. Their progressive motion is very different from that of the Frog or Toad; it is not either the quick jump of the former, or the tardy walk of the latter animal, but a wriggling run or shuffling walk. When taking their prey—which generally consists of Earth-worms, Slugs, or different kinds of insects, &c.—if not disturbed, it is interesting to observe the manner in which this is performed. By placing a live Worm a few inches before them, their attention is immediately directed to the object; fixing themselves in the attitude of a pointer Dog when setting its game, and with a peculiar turn of the head and glance of the eye, they immediately seize the writhing prey, and so instantly is it conveyed into their mouth and swallowed, that it requires the keenest eye to detect their movements. This operation is performed by means of the tongue, which is attached, differently from the same organ in animals in general, to the fore part of the mouth, and in a manner folds back upon itself, terminating at the back part of the mouth. In the winter season it is difficult to meet with these animals, as they retire into holes and cavities inland, under stones and in different

secluded situations, but on fine mild evenings they may be seen occasionally, and generally before rain commences.

I remain, dear Sir,
Yours very respectfully,
T. B. HALL.

Woodside, near Liverpool,
November 14, 1837.

SOME ACCOUNT OF AN EXCURSION TO THE SUB-MARINE FOREST, LEASOWES, CHESHIRE.

BY A MEMBER OF THE BRITISH ASSOCIATION.

ON Friday evening an announcement was made by the general secretary, that on the next morning steam-boats would be waiting to carry the members of the British Association to some iron-works down the river, or to Leasowes Castle, near the submarine forest. Saturday morning came, and with it torrents of rain. I walked into the town, and must confess, from the miserable and dirty appearance of the whole place, that I wished myself any where but in Liverpool. As I was walking along, half inclined to leave for Manchester, a transitory break appeared in the clouds; it became lighter, I looked at my watch, found it wanted but five minutes to one, the time the steamer was to start for the forest. I called a cab, and arrived at the docks before the packet had started. The rain again poured down, but I determined to keep on board and undergo the hardship which the miserable weather promised. The packet did not start at the time stated, on account of the smallness of the party, who at length one by one arrived, and when we set off numbered altogether twenty-four.

Who our company was I knew not, and I must confess, when we started we looked as unlikely a party to enjoy ourselves as ever I saw. The weather appeared to affect us all, and not one seemed inclined to say to another, how do you do? After dashing through the waves five or six miles, the steamer suddenly stopped, and we were informed that we must be put on shore by the boat. The wind blew, and the rain came down quickly, so as to deter several of the party from venturing across a mile or two of sea to the shore, lest they should be made permanent inhabitants of the submarine forest we were about to visit. However, with skilful sailors, who not only rowed us over a part of the sea, but carried us one by one on their broad shoulders, over several hundred feet, we were at length securely placed upon the beach.

And here we found ourselves safely arrived at the object of our expedition,

and had we not been wet through with the rain, and half frozen by the cold, we might have at once fallen into a reverie among the ruins of fallen greatness around us. There extended the roots of a mighty tree, that might once have been the monarch of the forest, and all around were the remains of trees of smaller growth, once the haunts of happy choristers, but now how changed the scene! There was, however, no time either to moralize or poetize. Our party scattered itself in various directions upon this forlorn beach, which was covered with the stumps and roots of trees, and the remains of their branches scattered in all directions, buried and kept in their situations by a deposition of mud. The shore in this situation inclines very gradually, so that an immense tract of ground is exposed at low tide. The remains of the forest extend for several hundred acres along the shore between the Dee and Mersey. I picked up several specimens of wood in a tolerable state of preservation. One of our party found the lower jaw of a fossil Elk. Some teeth and small bones were picked up by others, but such was the pitiless beating of the storm that it discouraged the energies of the most undaunted, and we accordingly made the best of our way to Leasowes Castle, which, though the residence of a private gentleman, is for the accommodation of the public opened as a public-house. In the Castle there are some fine rooms, and from its battlements an extensive view of the surrounding country is obtained, commanding the Irish Sea, the distant mountains of Wales, and the counties of Cheshire and Lancashire. In the hall were some shells, animals, and other objects of Natural History; hanging upon the wall were three fossil heads belonging to the *Ruminantia*. They were an Ox, an Antelope, and a Sheep, as near as I could make out; the head of the Ox and Antelope were of very large size. The antlers of the latter were large and entire. Underneath these heads there was an inscription stating that the heads were obtained from the submarine forest, corroborating the truth of an old distich that states—

From Burkinly even unto Fulnee
A Squirrel might leap from tree to tree.

This district is now entirely under water.

In one of the rooms of the Castle is the carved roof of the old star-chamber from Westminster Hall, being a gift to the family possessing this mansion, some branches of which have held offices in the Exchequer. In another room was a full length painting of WILLIAM the Third, and underneath the following inscription:—" WILLIAM III. embarked from these Leasowes on the expedition to the Battle of the Boyne."

Having looked over the house, and dried our clothes, we were summoned to a very welcome repast, which the liberality of our Liverpool friends had provided. Our party had by this time become mutually acquainted, and I think I may venture to say that no party brought together in an accidental manner could

enjoy themselves more than we did. After dinner, still being strangers to each other by name, it was proposed that we should write our names and leave them as a memorial with the gentleman of the local Committee who had come with us from Liverpool. The revelation thus brought about proved that we had not left behind us all the wisdom of our Universities, nor all those whose names were known to fame. After spending an hour or two in a very agreeable manner, we arrived at Liverpool in time for the *finale* meeting at seven o'clock.

CATALOGUE OF COLEOPTEROUS INSECTS FOUND IN DORSETSHIRE.

WITH NOTES, OBSERVATIONS, ETC.

BY JAMES CHARLES DALE, ESQ., A.M., F.L.S.

(Concluded from Vol. II., p. 415.)

GENUS ccxxi. ALEOCHARA.—Species 87. *umbrata.* Glanville's Wootton.—90. *fasciata.* Glan. Wootton.—98. *sericea* ?—104. *bipuncta,* OL.—108. *fuscipes,* PK. Glan. Woott.—*dimidiata.* G. W. and Cranborne Chace.

ccxxii^{b}. CALLICERUS.—1. *Spencii.* G. W.

ccxxvi. STENUS.—1. *bimaculatus.* G. W.—8. *pusillus.* G. W.

ccxxvii. PÆDERUS.—1. *riparius.*—2. *littoralis.*

ccxxviii. RUGILUS.—2. *orbiculatus.* G. W.—5. *angustatus.* G. W., Cranborne Chace.

ccxxix. SUNIUS ?—5. *angustatus.* G. W., Cranborne Chace.

ccxxx. AUTALIA.—1. *rivularis.*— ———— ? Seashore, Lulworth.

ccxxxii. EUPLECTUS.—3. *Karstenii* ? G. W., May 8, 1835.

ccxxxiv. ARCOPAGUS.—3. *puncticollis.* G. W.—4. *glabricollis* ? G. W.

ccxxxv. TYCHUS.—1. *niger* ? G. W.

ccxxxvi. BRYAXIS.—1. *juncorum* ? G. W.—5. *sanguineus*♀. West Stafford.—6. *longicornis* ♂. West Stafford.

ccxxxvii. PSELAPHUS.—1. *Herbstii* ? G. W.—2. *Heisei.* G. W.—3. *longicollis* ? G. W.

ccxxxviii. SCYDMÆNUS.—3. *hirticollis* ? G. W.—13. *thoracicus,* KUNZ. G. W.

ccxl. CORTICARIA.—4. *transversalis.*—8. *pubescens.*

ccxlii. CRYPTA.—1. *bipunctata.* Parley.

ccxlvi. MONOTOMA.—1. *picipes.* G. W.

ccxlvii.—SILVANUS.—2. *Surinamensis.* G. W., always in sugar.

ccxlviii. Bitoma.—1. *crenata*. Parley.
ccl. Rhyzophagus.—1. *ferrugineus*. West Stafford.
ccliii. Tenebrio.—1. *molitor*. Parley.—2. *obscurus*. Parley.
cclv. Pedinus.—1. *gibbum*. Portland.
cclvi. Opatrum.—1. *sabulosum*. Parley.
cclix. Phaleria.—1. *cadaverina*. Near Poole.
cclx. Crypticus.—1. *quisquilius*, L. Portland.
cclxi. Helops.—1. *caraboides*.—3. *cæruleus*.
cclxii. Blaps.—3. *mortisaga*. G. W., Blandford.
cclxiv. Melandrya.—1. *caraboides*, L. G. W., Sherborne, Charmouth.
cclxv. Cistela.—2. *ceramboides*, L. Parley.—3. *castanea*?—4. *fulvipes*, F. Bear Wood, near Holt Forest.—5. *murina*. G. W., &c.—7. *sulphurea*. Portland, Weymouth.
cclxv.[b] Omophlus.—1. *armeriæ*. Portland.
cclxvi. Lagria.—1. *hirta*. G. W.
cclxxii. Anaspis.—1. *frontalis*. G. W., &c.—3. *ruficollis*, G. W., &c.—4. *melanopa*. G. W.—10. *nigricollis*. G. W.—11. *biguttata*.
cclxxiii. Mordella.—1. *abdominalis*, F. G. W.—2. *pumila*. Hodd Hill and G. W.
cclxxiv. Ripiphorus.—1. *paradoxus*. G. W.
cclxxvi. Œdemera.—1. *podagrariæ*. G. W.—2. *cærulea*. G. W.—4. *lurida*. Portland, Charmouth.—5. *viridissima*. G. W.
cclxxviii. Conopalpus.—1. *testaceus*. G. W. (Mr. Curtis), bred March 11, 1821.
cclxxix. Pyrochroa.—1. *rubens*, F. G. W.
cclxxx. Meloe.—1. *violaceus*. G. W.—2. *proscarabæus*. G. W., &c. Small variety? Weymouth.—3. *tectus*. Parley.
cclxxxiii. Anthicus.—1. *antherinus*. G. W., on mud.—3. *ater*. Portland, under stones.—4. *fuscus*. G. W., and Maiden Castle.
cclxxxiv. Ptinus.—1. *imperialis*. G. W., on Whitethorne, May 26, 1823.—4. *museorum*?—5. *sex-punctatus*. Farleigh, near Beaminster, June 27, 1816.—6. *Fur*. G. W.—7. *crenatus*. G. W., &c.
cclxxxix. Ptilinus.—1. *pectinicornis*. G. W.
ccxc. Anobium.—1. *castaneum*. G. W.—2. *rufipes*.—4. *striatum*. G. W.—6. *tessellatum*. G. W.—9. *ptinoides*. G. W., on Alder.
ccxci. Dermestes.—2. *murinus*. G. W., &c.
ccxciii. Attagenus.—1. *pellio*. G. W., always in the house.
ccxciv. Anthrenus.—3. *museorum*, and 4. *varius*. G. W., in the house.—5. *verbasci*?—Also a small one in flowers at Blandford.

ccxcvii.[c] OOMORPHUS.—1. *concolor*. G. W., Parley, &c.
ccxcviii. SIMPLOCARIA.—3. *semistriata*. G. W.; Portland?
ccxcix. BYRRHUS.—1. *varius*. Holnest.—7. *pilula*. G. W., &c.
ccc. THROSCUS.—1. *dermestoides*, L. G. W., Mullets Copse.
ccci. TRACHYS.—2. *minuta*. Parley Copse.
cccii. APHANISTICUS.—1. *pusillus*. Newland Common and Lulworth.
cccvi. CERATOPHYTUM.—1. *Latreillii*. Parley Copse, July 1837.
cccix. ELATER.—3. *cupreus*. Near Sherborne, Mr. MORRIS.—5. *tessellatus*. G. W.—7. *metallicus*. G. W.—10. *ephippium*. Parley Copse.—16. *minutus*? G. W.—22. *bipustulatus*. G. W.—25. *holosericeus*. G. W. &c.—26. *murinus*. G. W., &c.—27. *fulvipes*. G. W.—30. *sputator*. G. W., &c.—31. *obscurus*. G. W., &c.—32. *lineatus*. G. W., &c.—39. *æneus*. Turnworth, Knighton and Parley Heaths.—44. *equiseti*. Portland Ferry.—47. *niger*. G. W., &c.—48. *nigrinus*? G. W.—50. *ruficaudis*. G. W.—55. *marginatus*. G. W., &c.—56. *limbatus*. G. W., &c.—57. *longicollis*. G. W., &c.
cccx. CAMPYLUS.—1. *linearis*. G. W.
cccxi. DASCILLUS.—1. *cervinus*. G. W.
cccxii. ELODES.—1. *melanurus*. G. W.—2. *lætus*? G. W.—3. *lividus*? G. W.—4. *marginatus*. G. W.—8. *padi*. Holnest.
cccxiii. SCIRTES.—1. *hemisphæricus*. Holnest, G. W.—2. *chrysomeloides*. Parley.
cccxv. LAMPYRIS.—1. *noctiluca*. G. W., &c.
cccxvii. TELEPHORUS.—1. *alpinus*. G. W.—3. *rusticus*. G. W.—4. *fuscus*. G. W.—8. *nigricans*. G. W.—9. *lituratus*. G. W.—11. *rufus*. G. W.—13. *lividus*. G. W.—15, *Cantianus*. G. W.—17. *thoracicus*. G. W.—18. *ater*? G. W.—19. *flavilabris*. G. W.—22. *testaceus*. G. W.—23. *pallidus*. G. W.—24. *lateralis*. G. W.—28. *melanurus*. G. W.
cccxviii. MALTHINUS.—4. *fasciatus*. G. W.—7. *immaculatus*. G. W.—12. *minimus*? G. W.—15. *brevicollis*. G. W. and Lulworth.
cccxix. MALACHIUS.—1. *æneus*. G. W., &c.—2. *bipustulatus*. G. W., &c. 3. *viridis*. Portland, Charmouth—12. *fasciatus*. G. W., Parley.
cccxx. DASYTES.—2. *flavipes*. G. W.—4. *æneus*? G. W.—5. *cæruleus*. Portland, Charmouth.—10. *impressus*. G. W.
cccxxi. TILLUS.—1. *elongatus*. Blandford, on a Currant bush.
cccxxii. OPILUS.—1. *mollis*. Sherborne, Mr. HEY.
cccxxiii. THANASIMUS.—1. *formicarius*. G. W., on a Fir trunk.
cccxxv. NECROBIA.—3. *quadra*. G. W.

cccxxvi. Corynetes.—1. *violaceus*. G. W., Blandford.

cccxxxiv. Scolytus.—1. *destructor*. G. W.—Also a black variety with four red spots. St. Caundle, Mr. Serrell.

cccxxxv. Hylesinus.—1. *crenatus*. Sherborne.—4. *fraxini*. G. W., Parley.

cccxxxvi. Hylurgus.—1. *pinniperda*. Holnest.—8. *rhododactylus*. Parley Heath on Furze.

cccxxxvii. Baris.—1. *lignarius*. G. W.

cccxxxix. Calandra.—1. *granaria*. G. W.

cccxl. Gymnætron.—1. *campanulæ*. Blandford race-course.—5. *tricolor*. G. W.—6. *graminis*. Moores river, Parley.

cccxli. Cionus.—1. *scrophulariæ*. G. W.—2. *verbasci?* G. W.?—3. *thapsi?* G. W.—5. *blattariæ*. G. W.—6. *solani*. G. W.

cccxlii. Sphærula.—1. *lythri*. G. W.

cccxliii. Orobitis.—1. *cyaneus*. Plumby Wood, Mr. Serrell.

cccxliv. Mononychus.—1. *pseudacori*. Near Lyme Regis, Mr. Morris.

cccxlx. Ceutorhynchus.—(There are several un-named species of this genus in my cabinet.)—4. *quercus*. G. W.—16. *litura*. G. W.—19. *ericæ?* Parley and Knighton Heaths.—23. *pollinarius*. G. W.—34. *sisymbrii*. G. W.—46. *horridus*. Lulworth and Maiden Castles, and Purbeck.—48. *castor*. Parley.—56. *comari*. Parley, Rev. W. Kirby, and J. C. Dale.

cccxlvii. Cryptorhynchus.—2. *lapathi*. Parley Copse and Charmouth.

cccli. Orchestes.—1. *alni*. G. W.—4. *quercus*. G. W.—8. *ilicis*. G. W. 9. *fagi*. G. W.—11. *salicis*. G. W., Parley, &c.

ccclii. Sibinia.—2. *primita*. Durdle Door, West Lulworth.

cccliii. Ellescus.—1. *bipunctatus*. Bere Wood.

cccliv. Tychius.—6. *picirostris?* Parley?—9. *venustus*. G. W., Parley.

ccccl v. Balaninus.—1. *nucum*. Elsington Wood, Holts.—2. *glandium*. Parley Copse, Cranborne Chace.

ccclvii. Grypidius.—1. *equiseti*. G. W.

ccclx. Dorytomus.—3. *tremulæ*. G. W.

ccclxii. Hypera.—3. *punctata*. G. W.—9. *arator*. G. W.—20. *rumicis*. G. W.—21. *nigrirostris*. G. W.

ccclxvi. Molytes.—2. *Anglicanus*. Charmouth.—3. *punctatus*. G. W.

ccclxvii.—Hylobius.—1. *abietis*. G. W., Lulworth, Parley, &c.

ccclxix. Alophus.—1. *triguttatus*. Portland.

ccclxx. Barynotus.—1. *mercurialis*. G. W., Charmouth.—3. *obscurus*. G. W., &c.

ccclxxi. Liophlœus.—1. *nubilus*. G. W., &c.

ccclxxii. Otiorhynchus.—6. *rugifrons?* Portland, Lulworth.—10. *tenebricosus*. G. W. &c.—12. *ater*. Portland Ferry.—14. *piceus*. G. W.

ccclxxiv. Thylacites.—4. *geminatus*. Portland and Maiden Castle.—5. *coryli*. G. W.—7. *obesus?* Parley.—10. *nigricans?* Parley.—13. *chætophorus?* Parley and Knighton Heath.

ccclxxiv. Sitona.—8. *tibialis?* G. W.—18. *fusca*. Portland Ferry.

ccclxxvi. Polydrusus.—4. *cervinus*. Bere Wood.—10. *undatus*. Bere Wood.—*oblongus*. G. W., &c.

ccclxxvii. Phyllobius.—1. *pyri*. Parley.—2. *cæsius*. G. W.—3. *alneti*. G. W.—5. *argentatus*. G. W.—6. *mali*. G. W.—8. *uniformis*. G. W. —9. *albidus?* Parley.

ccclxxviii. Tanymecus.—1. *palliatus*. G. W., Charmouth.

ccclxxix. Cleonus.—2. *nebulosus*. Parley Heath.—4. *sulcirostris*. Portland, Lewell.

ccclxxxi. Larinus.—2. *planus*. G. W.

ccclxxxii. Rhinocyllus.—1. *thaumaturgus*. Portland.

ccclxxxiv. Apion.—18. *vernale*. Lulworth.—19. *rufirostre*. G. W.—28. *æstivum*. G. W.—31. *frumentarium*. G. W. & Parley.—32. *hæmatodes*. Knighton and Parley Heaths.—60. *ononis*. Near Weymouth.—*punctifrons?* Parley.—70. *genistæ*. Newland Common and Parley.—72. *ulicis*. G. W. and Parley.

ccclxxxv. Rhynchites.—1. *minutus*. Parley Copse.—5. *æquatus*. G.W. —7. *betulæ*. G. W., Portland, Bere Wood.—9. *alliariæ*. G. W.—7. 10. *angustatus*. Parley Copse, Bere Wood, Hook's Wood.

ccclxxxvi. Deporaus.—1. *betulæ*. Bere and Elsington Woods, and Parley Copse.

ccclxxxviii. Apoderus.—1. *avellanæ*. G. W., Cranborne Chace.

cccxc. Bruchus.—2. *granarius*. G. W.—9. *cisti*. G. W., Hodd Hill.

cccxcii. Platyrhinus.—3. *latirostris*. Sherborne Park, Mr. Farnshaw.

cccxciii. Anthribus.—1. *albinus*. Gussage, Mr. Ingpen.

cccxcv. Salpingus.—1. *ruficollis?* Parley?—2. *viridipennis?* G. W., Parley.

cccxcvi. Sphæriestes.—2. *4-pustulatus?* Parley?

cccxcvii. Trogosita.—1. *Mauritannica*. Blandford.

cccc. Prionus.—1. *coriarius*. Parley.

ccccii. Cerambyx—1. *moschatus*. Wolveton.

ccccvi. Pogonocherus.—2. *nebulosus*. G. W.—4. *hispidus*. G. W.

ccccviii. Saperda.—7. *cylindrica*. Manston.—9. *præusta*.

ccccix. Callidium.—7. *alni*. Blandford, Parley.

ccccx. Clytus.—3. *arietis*. G. W., &c.

ccccxi. Obrium.—2. *minutum*. Dorchester, Blandford.

ccccxiii. Rhagium.—2. *inquisitor*. G. W., Parley.—3. *bifasciatum*. G. W., Parley.

ccccxiv. Toxotus.—1. *meridianus*.—2. *chrysogaster*. G. W., Parley.

ccccxv. Leptura.—1. *elongata*. G. W., Parley, &c.—3. 4-*fasciata*. Parley Copse.—9. *nigra*. Parley and Bear Wood.—10. *melanura*. G. W. 14. *femorata*.—16. *ruficornis*. G. W., &c.—*livida*. Parley Copse and Charmouth.

ccccxvii. Donacia.—1. *crassipes*. Parley, by Moore's river.—4. *angustata ?* Parley.—6. *lemnæ*. Parley.—7. *dentipes*. Parley and Wareham.—8. *sagittariæ*. Parley, Wareham, Middlemarsh.—10. *obscura ?* Parley. 12. *impressa ?* Parley.—13. *sericea*. G. W., &c.—14. *micans ?* G. W.?—17. *menyanthedis*. Wareham and P. town.—18. *simplex*, Parley, Wareham.—19. *linearis*, Parley, Wareham, &c.—20. *typhæ*, Parley.

ccccxx. Crioceris.—3. *puncticollis*. G. W.—4. *cyanella*. G. W.—5. *obscura*. Middlemarsh.—6. *melanopa*. G. W., Parley.—7. *asparagi*, Sherborne.—*subspinosa*. Caundle Holts, Mr. Serrell.

ccccxxii. Cassida.—1. *equestris*. P. town.—3. *rubiginosa*. G. W., &c.—4. *murrea*, G. W., &c.—5. *vittata*. Parley Heath, Thomas Vine.—6. *vibex*. G. W.; Plumley Wood, Mr. Serrell.—9. *obsoleta*. G. W.—12. *viridula*. Parley.—17. *Anglica*. G. W.

ccccxxiv. Galeruca.—1. *tanaceti*. G. W., &c.—2. *rustica*. Plumley Wood, Mr. Serrell.—3. *cratægi*. G. W., Parley, &c.—4. *viburni*. Middlemarsh and Plumley Woods.—4. *capreæ*. G. W., Parley.—7. *nympheæ*. Stinsford? Parley.—9. *calmariensis*. Stinsford.—10. *lineola ?* Parley.—12. *tenella*. G. W., Parley, Charmouth.

ccccxxv. Adimonia.—2. *halensis*. Maiden Castle, Lulworth, Knighton Heath, &c.

ccccxxvi. Luperus.—1. *rufipes*. Parley Copse and Elsington Wood.—2. *flavipes*. Parley Copse and Elsington Wood.—3. *brassicæ*. Parley Copse, Elsington Wood, G. W., Charmouth.

ccccxxvii. Altica.—1. *antennata*. Maiden Castle.—3. *nemorum*. G. W., &c.—6. *lepidii ?* G. W.—10. 4-*pustulata*. G. W., Parley.—16. *pseudacori*. G. W..—38. *pusilla ?* Maiden Castle.—47. *anchusæ*. G. W.

ccccxxviii. Macrocnema.—2. *hyoscyami*. G. W., &c.—2^b. *unimaculata*. Poole, Mr. Curtis.—*rufipes*. G. W.—*helxines*. G. W.—*cyanea ?* Parley?—*oleracea*. Parley, Elsington Wood, &c.—*erucæ*.—Stinsford

and Swanage.—28. *centaureæ*. G. W., &c.—30. *orbiculata*. G. W. —33. *mercurialis*. G. W.—36. *picina*. G. W.—37. *concinna*. Parley, &c.—*Matthewsii*. G. W.

ccccxxxi. Cryptocephalus.—4. *sericeus*. Portland, Charmouth.—7. *bipustulatus*. Near Parley Copse, and Knighton Heath.—8. *lineola*. Parley, Charmouth.—10. *moræi*. Charmouth, Mr. Morris; G. W.—12. *flavilabris*. Bear Wood, near Holt Forest.—16. *labiatus*. Parley, Bear Wood, and Elsington Wood.—19. *pusillus*. Portland and Parley.—Var. β? G. W., Hook's Wood.—Var. γ? Parley Copse.]

ccccxxxii. Helodes.—1. *phellandrii*. G. W., &c.—2. *beccabungæ*. G W., &c.

ccccxxxiii. Chrysomela.—1. *marginella*. G. W., &c.—2. *unicolor*. Elsington Wood.—3. *vitellinæ*. G. W.—5. *betulæ*. G. W.—6. *tumidula*. G. W.—9. *aucta*. G. W., Elsington Wood.—10. *polygoni*. G. W., Elsington Wood.—11. *raphani*. Stinsford.—16. *tremulæ*. G. W.—17. *populi*. G. W.—18. *polita*. G. W.—19. *staphylæa*. G. W. and Charmouth.—20. *Banksii*. Parley.—21. *lamina*. Sherborne, Mr. Morris. 24. *sanguinolenta*, Sherborne Park, Messrs. Morris and Cattley.—29. *hyperici*. Knighton Heath.—30. *geminata*. G. W.—31. *varians*. Stinsford.—32. *litura*. G. W., Parley, Charmouth.—44. *goettingensis*. Badbury Rings, Charmouth and Sherborne. 45. *hæmoptera*. Portland, Charmouth, G. W., and Batcomb Hill.

ccccxxxiv. Timarcha.—1. *tenebricosa*. G. W., &c.—2. *coriaria*. Cerne and Mintern Hills, Parley and Portland.

ccccxxxvi. Scymnus.—12. *litura*. G. W.

ccccxxxvii. Cacicula.—*pectoralis*. G. W., Sewell, Parley.

ccccxxxxiii. Coccinella.—5. *hieroglyphica*. Sewell plantation.—8. *humeralis*. G. W.—9. *dispar*.—10. *conglomeratus*. G. W., Parley.—12. *variabilis*. G. W., &c.—14. 12-*punctata*. Parley.—16. 7-*punctata*. G. W.—18. *oblongo-guttata*. Parley.—19. 16-*guttata*. Sherborne, Mr. Key.—22. 14-*guttata*. Parley and Blandford.—23. *globosa*. Parley, G. W.—*lateralis*. Winfrith, by Marley Wood.

ccccxxxix. Chilocorus.—1. *bipustulatus*. G. W., Parley.—2. *renipustulatus*. Elsington Wood.—4. 4-*verrucatus*. G. W., Elsington Wood.

ccccxl. Endomychus.—1. *coccineus*. Horton Firs, and Sherborne.

Glanville's Wootton, Dorsetshire,
August 9, 1837.

SOME ACCOUNT OF THE PRINCIPAL WORKS ON ENTOMOLOGY.

By Peter Rylands, Esq.

A volume, as Mr. Neville Wood justly remarks, would be necessary to contain satisfactory notices of *all* the works which have been published on Entomology. This, however, does not appear requisite, and probably a chapter devoted to a brief retrospect of a few of the more important, will be of the desired use to the student.

For a long period after the time of Aristotle, whose labours have already been sufficiently commented upon (Vol. II., p. 463), Entomology shared the neglect with which other branches of Natural History were treated. Of the authors who contributed to its partial revival in the sixteenth, and commencement of the seventeenth century, Freuzius, Mouffat, Jonston, Aldrovandus, and Goedart may be mentioned—their works are now only valuable as curiosities. There was one, however, at this early period, zealously engaged in prosecuting the same study, the result of whose labours remains of real worth at the present day. This was the celebrated John Swammerdam, whose *Biblia Naturæ* appeared in 1728, several years after its author's death. An English translation by Floyd was published in 1758, and remains a standard authority. Cotemporary with Swammerdam were Rhedi, Borel, Bononio, Bonanni, and Joblot, who also directed their attention to the physiology of insects, but their works, although once valuable, may now be dispensed with.

In the early part of the eighteenth century Entomology continued to excite the attention of philosophers, as between the years 1700 and 1730 various works devoted to it were written by Albin, Ray, Willughby, Petiver, Bradley, Valisnieri, and others. None of these, although once much esteemed, are now regarded as authorities.

We have now arrived at the commencement of an important era in the history of the science, caused by the publication, in 1735, of the *Systema Naturæ* of Linnæus, which is familiar to all, and therefore needs no comment here, especially as it is noticed in Mr. Wood's paper; to the observations of that gentleman, I would only add my conviction that much of the difficulty experienced by students, in attaining a knowledge of modern classifications, would be removed if previous to commencing the study of them, that of the great Swede was perfectly understood,—and an acquaintance with it by a little assiduity and perseverance may soon be obtained. Rœsel, Edwards, Réaumur, Drury, Sulzer, Sepp, Scopoli, and De Geer, followed the example of Linnæus, by publishing works on the science which he had so greatly benefitted. Many of these remain at the present time standard authorities. *Mémoires pour servir à l'His-*

toire des Insectes (6 vols. Paris, 1742), by Réaumur, contains much that is interesting, and will richly repay perusal. Sepp on the *Insects of the Netherlands* (3 vols. 4to., Amsterdam, 1762), Scopoli's *Entomologica Carniolica* (Vindoboniæ: 1763), Drury's *Illustrations of Natural History* (3 vols. 4to., London: 1772), and De Geer's *Histoire des Insectes* (7 vols. 4to., Stockholm, 1752), although not absolutely necessary, are valuable for reference.

During the year 1775 the celebrated Fabricius published the first edition of his *Systema Entomologiæ* (1 vol. 8vo. Fleusburgi, et Lipsiæ), which was followed by his *Species Insectorum* (2 vols. 8vo. Hamburgh, 1781), his *Genera Insectorum* (Kilonii, 1776), *Mantissa Insectorum* (2 vols. Hafniæ, 1781), *Philosophiæ Entomologiæ* (1778), *Systema Eleutheratorum* (2 vols. 1801), *Syst. Piezatorum* (1804), and his *Syst. Antliatorum:* all may be consulted with advantage. Shortly after the publication of *Systema Entomologiæ*, Olivier's *Histoire Naturelle des Insectes* appeared in Paris, which, from the beauty of the plates, and the accuracy of the descriptions it contains, will always be considered a valuable addition to the library of an entomologist.

In 1778 Moses Harris published a beautiful work entitled "*The Aurelian;* or, Natural History of British Moths and Butterflies;" and about the same time appeared Cramer's *Figures of Exotic Lepidoptera*, and Rœmer's "*Genera Linnæi et Fabricii Ilustrata*," which are still considered of value. Of the works published at this period, Smith and Abbott's *Insects of Georgia* (London: 1797), Ernst's *Papillons d'Europe* (8 vols. Paris: 1793), Hubner's *European Lepidoptera* (2 vols. Augsburg: 1796, &c.), and Esper's work on the same subject (5 vols. Erlangen: 1777, &c.), are truly excellent, but too expensive for the majority of students. The same may be said respecting Donovan's *Natural History of British Insects*, in 16 vols. (London: 1798, &c.), but his *General Illustrations of Entomology* (3 vols. London: 1805), may easily be dispensed with.

It will now be necessary to take a brief glance at some of the works which have been published during the present century. Kirby and Spence's invaluable *Introduction to Entomology* (4 vols. 8vo. London: 1826, &c.), it is scarcely necessary to remark, ought to be attentively perused—and that more than once—by all who desire a good elementary knowledge of the science. Dr. Burmeister's *Manual of Entomology* (a translation of which appeared in 1836), also forms an interesting and useful introduction to the science, although it is necessary to caution the student against using the loose, defective system of nomenclature which sullies its pages. Samouelle's *Entomologist's Useful Compendium* deserves its title, as it contains much that cannot fail to be useful to the reader.

Curtis's *British Entomology*, aud Stephens's *Illustrations*, are invaluable, and if possessed will render the purchase of Rennie's *Conspectus of British Moths and Butterflies* unnecessary. The other works by this author, although

calculated to diffuse a superficial knowledge of, and perhaps excite a taste for, Entomology, are of scarcely any use to those who have attentively perused the elementary works above mentioned.

Captain THOMAS BROWN'S *Book of Butterflies and Moths* (London : 1832), is a catch-penny compilation, illustrated with plates which perhaps might have satisfied the entomologists of the seventeenth century, but to those of the present appear remarkable alone for their inferiority. Of a very different character are the beautiful and interesting volumes of Sir W. JARDINE'S *Naturalist's Library* devoted to insects; their surprisingly low price places them within the reach of all interested in the science; need it be added that *all* will do well to procure them.

The late edition, by GRIFFITHS and others, of CUVIER'S *Insecta* (2 vols. London: WHITTAKER and Co.), although of little use for the determination of species, contains, under the supplements to the orders, much that is valuable, and may be perused with advantage.

The utility of the *Guide to an Arrangement of British Insects*, by Mr. CURTIS, has been fully shewn at p. 336 of the 2nd Vol. of *The Naturalist;* why is the similar Catalogue of STEPHENS, the first part of which appeared in 1834, suffered to remain in a state of incompletion?

During the present year, the fourth part (containing the Insects) of *Fauna Boreali-Americana*, by Mr. KIRBY, has been published; not having seen it, I am unable to speak to its merits, but doubt not, from the known talents of the author, that it will form a valuable addition to our entomological literature. This brings my brief and necessarily very imperfect retrospect of works published on Entomology to a close. It ought perhaps to be remarked that several important works which illustrate the study of insects, in connexion with the other classes of the animal kingdom, have been omitted in this summary, as they are sufficiently noticed in Mr. NEVILLE WOOD'S excellent paper on Zoological Literature, which has been previously referred to. I conclude by expressing a desire that this paper—imperfect as it is—will answer the end for which its compilation was requested, and has been undertaken.

Bewsey House, near Warrington,
Dec. 4, 1837.

DERIVATIONS OF THE LATIN NAMES OF PLANTS.

Article I.

By Mr. T. B. Hall.

According to the request of Mr. Edwin Lees, at Vol. II., p. 420, of *The Naturalist*, I send you a list of the derivations of the names of our British plants; I prepared it for my own use previous to undertaking the study of Botany, and have since found it very useful, as it contributed much to fix the names in my memory. I was not aware, at the time that I took so much pains in collecting the derivations from various old works, that Sir W. J. Hooker had given them in his valuable work, the *British Flora*, but as that may not be in the hands of many of your readers, I trust these derivations, imperfect as they may be found, will prove acceptable. The remarks that I added at the time were principally from Sir J. E. Smith's *English Flora*, and the works from which I extracted the derivations; but from having access to various botanical works, I am enabled to add considerably to them, and trust that they will not be found altogether uninteresting. To such as are well acquainted with Botany they may perhaps be looked upon as trifling,* but to those who are accustomed to look upon Botany as a dry study, these casual remarks may perhaps be the means of leading them to reconsider their verdict. I have made such additions from Sir W. J. Hooker's *British Flora* as will I think make the derivations tolerably complete; but should there be any deficiencies, perhaps some of your correspondents will supply them, and correct any that may be wrong or misapplied.

If you deem them worthy of a place in your valuable magazine, I shall be happy to send you a continuation, either with or without the remarks, as you may consider best. It gives me great pleasure to revert to the period when I first compiled it, in conjunction and with the assistance of a friend who was at that time enthusiastically fond of Botany, and to whom I am almost entirely indebted for what little knowledge I possess of that study.

Acer.—From *acer*, sharp or hard, on account of the sharpness of its juice and hardness of the wood. It is the badge of the clan Oliphant.

Acer campestre, Common Maple.—This was formerly the principal wood for all kinds of cabinet work, and, according to Evelyn, the knobs of ancient trees affording beautiful and richly-variegated specimens were collected by the curious at high prices. When beautifully veined or spotted, it was much prized by the

* Were this the case, it is not likely that Mr. Lees would have made the request. We moreover positively know that many good naturalists are ignorant of the signification of the terms they daily employ.—Ed.

Romans, and of such were composed the celebrated Tigrine and Pantherine tables; of which some particular specimens, as those of CICERO, ASINIUS GALLUS, King JUBA, and the Mauritanian PTOLEMY, are said to have been worth nearly their weight in gold. But in modern times it has been in a great degree superseded by mahogany. At that remote era it was deemed a suitable material for purposes of state, and thus VIRGIL—

> "A maple throne rais'd higher from the ground
> Receiv'd the Trojan chief."

PLINY eulogizes the knobs and excrescences, the brusca and mollusca of this tree, which often represented, in their natural contortions, birds, beasts, &c., as does OVID the clouded or mottled Maple. When allowed to grow to timber, it makes excellent gun-stocks, and screws for cider-presses. The Maple, though in our time rarely permitted to rise higher than brush-wood, has been known to exist more than two centuries: at Knowle, in Kent, the Duke of DORSET'S seat, one measures twelve to fourteen feet in growth. The wood is much used for turning in the lathe, and vessels may be thus produced so thin as to transmit light. The foliage assumes a remarkably rich and mellow autumnal tint, of the successive variations of which an elaborate description may be found in the *Journal of a Naturalist;* where also it is remarked that Maple is useful in hedges, not from the opposition it affords, but by reason of its very quick growth from the stole after it has been cut, whence it makes a fence in a shorter time than most of its companions; and when fire-wood is an object, it soon becomes sufficiently large for that purpose. The leaves often in summer exhibit a white mouldy aspect, which appears to be a mere exudation.* The younger foliage, in spring, is beset with numerous red-coloured spiculæ, conjectured by the above writer to be occasioned by the puncture of some insect, probably for the formation of a nidus for its young. A thin slice of the singularly rugged young shoot, cut through horizontally, presents a beautiful and curious object in the microscope (*Journ. Nat.*, pl. 4, fig. 1.), exhibiting the different channels and variously-formed tubes through which the sap flows, and the air circulates for the supply of all the diversified requirements of the plant; "it is good and delightful," adds the author of the same work, "to contemplate the wonderful mechanism that has been devised by the Almighty Architect, for the sustenance and particular necessities of the simple Maple; which naturally leads one to consider that, if He has so

* Mr. W. BAXTER, in his *Flowering Plants*, observes hat this is probably occasioned by the interwoven filaments of *Erysiphe bicornes*, a minute parasitical fungus, the receptacles of which he finds very commonly interspersed amongst these filaments on the leaves of the Maple in the neighbourhood of Oxford.

regarded such humble objects, how much more has He accounted worthy of His beneficence the more highly-destined orders of His creation !"

To the admirers of the picturesque, to the lovers of human nature imbued with its most amiable attributes, the Maple has acquired additional interest, since beneath its shade, in Boldre Church-yard, are deposited the remains of the pious GILPIN. There rests from his useful labours the exemplary parish priest, and the able illustrator of the circumjacent-scenery.

Acer pseudo-platanus, Greater Maple, Mock Plane-tree, Sycamore.—This tree flourishes best in open places and sandy grounds; but will thrive very well in richer soil. It grows quick—is easily transplanted—bears cropping—and grass flourishes under its shade. It is said to grow better near the sea than in any other situation, and that a plantation of these trees at fifty feet asunder, with three Sea Sallow-thorns between every two of them, will make a fence sufficient to defend the herbage of the country from the spray of the sea (*Gent. Mag.*, 1757, p. 252.). The wood is soft and very white. The turners form it into bowls, trenchers, &c. (the use of which is frequently mentioned by both ancient and modern poets). If a hole is bored into the body of the tree when the sap rises in spring, it discharges a considerable quantity of sweetish watery liquor, which is used in making wines, and affords a fine white sugar (though the produce is far less abundant than that from the North American *Acer saccharinum*, the proper Sugar Maple), the art of extracting which was known to the aboriginal tribes; and some quantity has been for many years sent to France to be refined. The polen appears globular in the microscope, but, if touched with moisture, these globules burst open with four valves which assume the form of a cross. *Scarabæus melolontha* feeds upon the leaves. The seed of the Sycamore affords a pleasing instance of the care that Nature takes for the preservation of her infant germs. In the seed (soaked in warm water) we shall find the radicle and long radical leaves of the future plant folded up in an extraordinary manner, with the minute leaves that are to succeed them folded in their bosom; these radical leaves are beautifully green, a circumstance not to be expected, as all light is excluded by three coatings, and a woolly wrap that invests them. The bounty and wisdom of Providence in nothing is more remarkably manifest than in the intelligence displayed, and the provision appointed, for the young of organized and inanimate nature. The egg of a bird or insect, or the seed of a plant, should alone humble to the dust the arrogance of man.—*Nat. Diary*, T. T. 1824.

The Sycamore would appear to have been originally an exotic, gradually introduced into Britain for ornament and shade. TURNER and EVELYN deny its being indigenous, and PARKINSON in 1640 says, "It is no where found wild or natural in our land that I can learn, but only planted in orchards or walks for shadowe's sake." It was little known in England so late as the seventeenth

century. Chaucer speaks of it as a rare exotic in the fourteenth century; and Gerard in 1597, as "a stranger in England, which groweth only in the walkes and places of pleasure of noblemen." It makes a beautiful appearance in bloom (in May), and affords much pabulum for Bees, smelling strongly of honey. Gilpin observes, "It affords an impenetrable shade, and often receives well contrasted masses of light. Its bark has not the furrowed roughness of the Oak; but it has a species of roughness very picturesque. In itself it is smooth; but it peels off in large flakes like the Planes (to which in other respects it bears a near alliance), leaving patches of different lines, seams, and cracks, which are often picturesque." It is highly ornamental in rural scenery, in spring, by the delicate green of its luxuriant foliage, and in autumn, when

"No tree of all the grove but has its charms;
Though each its hue peculiar;
* * * * * *
* * * * nor unnoted pass
The Sycamore, capricious in attire,
Now green, now tawny, and ere Autumn yet
Have changed the woods, in scarlet honours bright."

Among the larger specimens of British growth Strutt describes one at Cobham Park, which measures twenty-six feet in circumference at the ground, and ninety-four in height; also one at Bishopton, Renfrewshire, twenty feet in growth, and sixty feet in height. To secure varieties (the principal of which is the striped) for pleasure grounds, budding, grafting, and inarching are practised: and it may be here observed, that variegated plants in general should be planted in poor hungry soil, to encourage the disease which occasions these beautiful stripes, thus causing them to become more distinct. But these fancy trees, when confirmed, show their peculiarities to more advantage in a good soil.

Achillea (αχιλλεια).—From Achilles, who is said to have cured Telephus with it.

Achillea ptarmica, Sneeze-wort Yarrow, or Goose-tongue.—The whole plant, and especially the root, has a pungent, biting taste, and when chewed in the mouth, like Pellitory of Spain (for which it is sometimes sold in the shops), it promotes a flow of saliva, and is found serviceable in the cure of the tooth-ache. In spring the young tender shoots are put into salads to correct the coldness of other herbs. The dried powder of the leaves snuffed up the nostrils excites sneezing; hence it has acquired the name of Sneeze-wort. Horses, Cows, Goats, Swine, and Sheep eat it; to the latter it is particularly acceptable. A variety with double flowers is not uncommon in gardens, where it is known by the name of Double Ptarmica, or Bachelors' Buttons, but it should be admitted with caution, the creeping roots extending more rapidly than may be desirable.

Achillea millefolium, Common Yarrow or Milfoil, Thousand-leaved Grass.—The flowers yield an essential oil. The leaves and flowering heads are celebrated by the Materia Medica writers as stimulant and stomachic in infusion, but are little attended to at present. The leaf loosely rolled together, and put up the nostrils, causes, by an external blow of the finger, a bleeding at the nose, more or less copious, according to the state of the vessels within; whence the vulgar name Nose-bleed. Sheep and Swine eat it. Horses, Cows, and Goats are not fond of it. Though the productive and nutrient properties of Yarrow are inferior to those of other plants equally adapted to light soils, Mr. Sinclair considers it an indispensable ingredient of the most fattening and healthy pastures, in which he suspects it may be destitute of sanative effects. We are assured by W. P. Taunton, Esq., in *Hort. Gram.*, that the prevalence of this plant indicates a siliceous soil. It is sometimes used in the north of Europe as a substitute for Hops, and also supposed to increase the inebriating quality of malt-liquor. Hooker states that it is highly astringent, and that the Highlanders are said to make an ointment of it, which dries and heals wounds.

Achillea tomentosa.—The whole herb, as well as the flower, has an aromatic scent when rubbed. It serves to decorate rock-work in gardens, but will not bear wet or shade.

Woodside, near Liverpool,
Dec. 4, 1837.

(To be continued.)

CORRESPONDENCE.

Queries and Notes respecting Certain Plants.

To the Editor of the Naturalist.

Dear Sir,—As I consider your magazine a medium for receiving information as well as for communicating the same, perhaps some of your correspondents will inform me whether there is such a plant as *Malope grandiflora* in Loudon's *Hortus Britannicus.* I have the last edition, but cannot find it; or whether there is such a species or not. I have a dried specimen of another plant which I cannot find in Loudon's Catalogue. It is mentioned in the catalogue of garden flowers in Howitt's *Book of the Seasons* under the name of *Nigella Romana*, but I can find neither it nor a synonym in Loudon's *Hortus Britannicus.* I should also be obliged for information respecting *Alyssum odorata* and *An-*

tirrhinum aryophyllum, whether there are such plants in the catalogue before mentioned.

In Mr. WATSON's *New Botanist's Guide, Clematis bitalba* is not mentioned as occurring in Essex, but when I visited that county in August I met with it very plentifully in all the hedges about Coggeshall, where I gathered *Dipsacus pilosus* in great abundance from the locality mentioned in the *Guide;* it was also plentiful in Little Coggeshall, on the road to Fielvedon. I found *Antirrhinum minus* very abundant in corn-fields on the estate of Lord WESTERN, and noticed a single specimen of another species which I took to be *Antirrhinum spurium. Plantago media* was very common about Coggeshall, which I merely mention to record its entire absence from the Liverpool Flora. At Maldon, among the salt marsh plants common to the muddy inlets of the Mersey, such as *Statice armeria* and *S. limonium, Chenopodium maritimum*, &c., I found *Salsola fruticosa*, very abundant, near the baths, on the banks of the reservoirs which are made to collect the salt water at high tides. I likewise noticed *Clinopodium vulgare* very abundant every where by the road-sides. It also occurs, but not plentifully, with us. As I have always considered it a very common plant, I was surprised to find it included in WATSON's *Guide*, it must therefore be absent from some counties. I may further mention that I have a specimen of *Statice* from Jersey, but without any radical leaves, labelled as *S. latifolia*. Perhaps Mr. BABINGTON or some of your correspondents who have visited Jersey will inform me if that plant has been discovered there.

In Lord WESTERN's Park I noticed a splendid tree, *Fagus castanea*, in flower. From the beauty of the flowers and foliage I should think it had a very doubtful claim to be ranked among our native trees. *Carex pseudo-cyperus* and *Thymus serpyllum* also occurred in the Park. *Alopecurus agrestis* was very abundant in all the corn-fields; in this neighbourhood it is of very rare occurrence. *Bryonia dioica*, common about Coggeshall, is absent from the Liverpool Flora. I believe it does not occur nearer than Chester, from the neighbourhood of which Mr. TUDOR, of Bootle, has specimens. *Sambucus ebulus* occurs in the lane leading to the Abbey Mills. *Sagittaria sagittifolia* and *Rumex hydrolapathum* are plentiful in the Blackwater river, but rare with us. *Arum maculatum* and *Daphne laureola* are common on hedges about Coggeshall. The former is very rarely found in the neighbourhood of Liverpool, and the latter most elegant shrub is not found at all. In the early spring I used always to be delighted to meet with this shrub; its graceful mode of growth and its flowering early in the spring are both of them claims for the regard of the botanist.

I remain, dear Sir,

Yours respectfully,

T. B. HALL.

Woodside, near Liverpool,
Nov. 14, 1837.

Promiscuous Notes on various Topics.

To the Editor of the Naturalist.

Respected Friend,—In reply to the query by E. Blyth in your September number (Vol. II., p. 291), as to the sexes of my specimens of *Papilio podalirius*, I may inform him that they appear to be male and female. I may also observe that I do not know whether the Pterocles are blind at birth or not, and remain in the nest a considerable time. I certainly should be surprised to find so great a deviation from the habits of their congeners in that respect. Still, as I have no opportunity of ascertaining the point, I will not assert that they dó or do not, but must merely say as I did before, that I believe all the *Tetraonidæ* see and run from their nests at birth.

Notwithstanding the unusual severity of the past spring, and the late appearance of the generality of our spring birds, a single Swallow was shot in the immediate neighbourhood of York on the first of April, which is earlier, with one exception, than I ever recollect meeting with Swallows myself.

Some months back a Grey Parrot which had been a great favourite, and, as I understand, one of the greatest talkers of its species, was submitted to my examination, as its owner suspected its death had been occasioned by poison. On examination I found that its death was owing to pulmonary consumption. The lungs were one mass of pus; and on being placed in water, immediately sank to the bottom. I believe a very large proportion of the Monkeys brought to this country die of this complaint; and one would not be surprised to find that birds from warm and tropical climates did the same. Still, out of all the birds I have dissected, amounting to some hundreds, this is the first instance I have detected of diseased lungs; and I should like to know whether any of your correspondents ever met with similar cases. Birds seem in a great measure exempt from the diseases of quadrupeds; it is very common to find diseased and carious bones in quadrupeds that have been kept in confinement, the disease extending over most of the extremities; but it is very unusual to find a diseased state of the bones in birds, except in the immediate neighbourhood of an injury. I have myself only met with a single instance of a bird where bones were generally diseased. It was that of a King Vulture which was sent me by the noble proprietor of the Knowsley aviary [the Earl of Derby.—Ed.], and the disease appeared to have its origin in a broken wing.

Since I sent my paper on the Rasorial birds (Vol. II., p. 57) Swainson's second volume *On the Classification of Birds* has made its appearance. There the *Columbidæ* are also classed in the *Rasores*. This induced me to read to a club of some of the members of our Philosophical Society a paper "On the Quinary System, as carried out by modern ornithologists in the Rasorial order of

birds." It necessarily is very similar to my former paper, but takes a wider view of the subject. If you would like to insert it, I may perhaps forward it for that purpose. It is applied more particularly to SWAINSON's views and statements.

I am, respectfully, thy friend,
THOMAS ALLIS.

York, 11*th Mo.* 4, 1837.

[We think we may safely state that we shall at all times be most happy to insert any communications from the pen of Mr. ALLIS; and we will gladly receive his proposed paper, having never yet met with anything approaching a philosophical refutation of the Quinary system.—ED.]

CHAPTER OF CRITICISM.

ON ORNITHOLOGICAL NOMENCLATURE.

To the Editor of The Naturalist.

SIR,—I cannot help thinking that my friend Mr. MORRIS has been unnecessarily severe in his animadversions on me and on my paper, which you did me the honour of inserting in your September number (Vol. II., p. 302). I must acknowledge that I was rather surprised at the nature and manner of his observations; in short, good Mr. EDITOR, *obstupui, steteruntque comæ, et vox faucibus hæsit.* His wit is so brilliant, and the edge of his satire so keen, that I was quite dazzled by the bright coruscations of the one, and I fear that it will be useless for me to attempt to ward off the fell swoops of the other. I hope you will in fairness allow me to say a few words in reply, not in a spirit of revenge and retaliation, but with the utmost good nature and good feeling towards him. I begin by replying to his question—"whether I have ever read or seen CUVIER's *Règne Animal*," that I am as little likely to quote works which I have never seen, as himself, or any other of your correspondents. He thinks it may be as well in some cases to mention the sources from which information has been derived. I will do so. I have never set myself up as an oracle in any department of Natural History, but I truly feel myself to be, what I stated in my paper, viz., "a very humble student of the delightful Book of Nature," and am always thankful for any information which I may obtain, even from the humblest source, and it gives me pleasure to be enabled to communicate any to others. What little knowledge of Ornithology I actually possess, I have obtained by a diligent perusal of the *Règne Animal* of CUVIER (an excellent English

translation of which I have in my possession), SELBY'S *Ornithological Illustrations*, MONTAGU'S *Ornithological Dictionary*, and though last not least, the *British Birds* of that prince of xylographers, THOMAS BEWICK. I have also read a multitude of papers in the *Zoological* and other Journals by SWAINSON, VIGORS, GOULD, &c., and have examined specimens of nearly all our British birds in various collections, public and private, provincial and metropolitan; in Mr. MORRIS'S among the rest, to which I have had the pleasure of contributing some specimens, and hope still to be enabled to do so.

I did not state that CUVIER had actually *laid it down as a rule*, that generic names should invariably be of Greek, and specific ones of Latin origin; but I positively affirm that he has acted on it in practice in the great majority of names throughout his invaluable work,—on reference to which I find the description of the Nutcracker is headed—"*Caryocatactes* (CUV.)" only. It is true, even to a proverb, that every general rule is liable to exceptions (except, of course, Mr. MORRIS'S general rule as applied to scientific zoological nomenclature), and the principal object I had in view in my paper, was to prove that no such exceptional general rule was necessary, or likely to be generally adopted. It is easy enough for any one to *lay down* general rules, but the question is, will the scientific world *take them up*, or, as SHAKSPEARE says, "you may *call* Spirits from the vasty deep, but will they *come* when you do call them." If any applause however is due to the proposal above alluded to, I simply say, "*Palmam qui meruit, ferat*" (meaning, of course, Mr. MORRIS). If any part of my paper was unintelligible or obscure, I am sorry for it; my meaning in the clause to which Mr. MORRIS has particularly directed your attention is this: that it ought to be considered equally admissible to give birds, &c., names (both generic and specific) composed wholly of *Greek*, or of *Latin*, or of *both*, provided the names themselves are truly appropriate. To illustrate my meaning still more plainly, take, for example, *Himantopus melanopterus* (both of Greek origin), *Falco peregrinus* (both Latin), *Machetes pugnax* (one of each); but where *both* languages are employed in naming the same individual, that the *generic* name should be of Greek and the specific of Latin origin; *Caryocatactes nucifraga*, for instance, I consider better than *Nucifraga caryocatactes*.

Allow me to say a few words, Mr. EDITOR, on your own critique on my paper.—You blame me for doing what has been done by the most eminent naturalists, from the earliest antiquity to the present time; in short, from ADAM to ARISTOTLE, from ARISTOTLE to PLINY, from PLINY to LINNÆUS, from LINNÆUS to CUVIER, and from CUVIER to Messrs. MORRIS, SWEETING, &c., for naming the Osprey *Ichthyaetus piscivorus*, because *both words carry the same meaning*. What think you of *Machetes pugnax* (CUVIER), *Caryocatactes nucifraga* (NILLSON), and *Aetus Aquila* (MORRIS)? and if these *Colossi* of literature and science are right, why am I to be considered wrong for doing the same thing? Will you

be good enough to inform me from what uncivilized quarter of this terraqueous globe so opprobrious a name as "Ossifrage," for the White-tailed Erne or Sea Eagle (*Haliæetus albicilla*), could have originated? I certainly never wrote any such name, although it appears in my paper.

I hope what I have said will be satisfactory to Mr. MORRIS, as I can assure him that I meant nothing personal by saying that the practice of giving generic names of Greek and specific of Latin origin, did not originate with Mr. Anyone, as I believe others as well as himself have laid claim to the same thing; at all events I shall not enter into any further controversy on the subject, as it cannot advance the cause of science, which ought to be the grand object of a scientific journal; but I am in hopes of having the pleasure of a personal conference on these interesting matters with him before Christmas. Sincerely wishing him as the Proprietor, and yourself as the Editor, of this Journal, every success,

I remain, Sir,

Your most obedient and very humble Servant,

R. H. SWEETING.

Charmouth, Dorsetshire,
Nov. 13, 1837.

[Assuming that the *colossi* of science must, in our estimation, be right, is "begging the question." In the instances alluded to by Mr. SWEETING we should unhesitatingly declare them to be *wrong*. But be this as it may, we see no just cause for adopting anything merely because it is the emanation of a great mind, and without employing our own intellect in the matter.—"Ossifrage" is no word of our coinage—it is nothing more than *Ossifraga* anglicised.—Touching the proprietorship of *The Naturalist* our correspondent may possibly be mistaken.

The publication of some parts of Mr. MORRIS's criticism of Mr. SWEETING's letter was an infringement of our usual rules; but we are sure our readers will bear us out in the assertion that *The Naturalist* is, in general, by no means inclined to be combative or personal. We are bound, in justice to Mr. SWEETING, to insert the preceding epistle, but can admit no further recrimination that could in any way wound the feelings of the individual against whom it is directed.—ED.]

MR. MACGILLIVRAY'S ARTICLES ON ANATOMY.

To the Editor of the Naturalist.

SIR,—In the second volume of *The Naturalist*, p. 13, there is an admirable article on the wings of birds, by Mr. MACGILLIVRAY, at the end of which the author promises to continue his papers on the same subject (that of Ana-

tomy) in future numbers of this journal. My aim in now addressing you is to ascertain whethery ou have refused Mr. M.'s articles, or whether that gentleman has failed to redeem his pledge. I am in hopes that this little hint may induce him to continue the series if the fault rests with him, or that you will no longer withhold the communications if you possess them.

I am, Sir,
Your humble Servant,

London, Aug. 12, 1837. A MEDICAL STUDENT.

[We think it little likely that we should ever feel inclined to reject any communications from Mr. MACGILLIVRAY'S pen.—ED.]

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

ORNITHOLOGICAL SOCIETY OF LONDON.

THE first general meeting of this society for the present Session, was held on the 3rd of November, at the Society's Rooms, Pall Mall,—N. A. VIGORS, Esq., M.P., in the chair.—The minutes of the last meeting having been confirmed, the Secretary proceeded to read the Report, which was highly satisfactory and unanimously adopted. On the motion of Mr. MACLEAY, seconded by the Rev. C. PAGE, CHARLES LUCIAN BONAPARTE, Prince of Musignano, Mons. TEMMINCK, and Mr. AUDUBON, were elected foreign members of the society.

Mr. BLYTH, having been called upon by the chairman, rose and delivered a conversational lecture on the exquisite adaptation of means to end, exhibited in a variety of interesting modifications of structure, noticeable in various birds, and the purport of which had not been previously explained.—He first called attention to the presence of aigrettes or ear-tufts in the great Snowy Owl, which were very obviously perceptible in the magnificent specimen before him, so much so that he was astonished they had never before been remarked by naturalists. It afforded him more pleasure than surprise to have detected their existence in this bird, as it beautifully corroborated the views he had long previously entertained and expressed respecting the systematic relations of the genus to which it belonged.—The announcement of this structure in the bird in question was received with much interest by all the naturalists present. Mr. BLYTH then proceeded to call attention to a singularity of habit, rather than a peculiarity of structure, which was practised by the Motmot genus (*Prionites*), the members of which—as was well known to all conversant with exotic Ornithology—were

accustomed to nibble off a small portion of the vane of their long middle tail feathers, within a short distance of their extremity, leaving the tips barbed and untouched, as also the entire remainder of their plumage. The same habit was pointed out as existing in an Indian group of Magpies (*Dendrocettæ* of GOULD), which considerably resembled the Motmot in outward form, and it was suggested that attention and observation of the two groups, considered relatively, might possibly elicit the intent of so anomalous a practice. The protuberance on the beak of the Hornbills furnished the next subject of consideration, which was descanted on at some length, and attention was called to a similar appendage in the Ani (*Crotophaga*), a South American genus, its presence in both instances being accompanied by eyelashes, which is of very unusual occurrence among birds, and which connection argued that the protuberance was not designed for mere ornament, as some have supposed, but evidently for a direct object, probably to detach particles of dust, from which the eyelashes would seem intended to protect the eye. The gull-tufts of the Heron group—a tuft of peculiar unelastic cottony down, present in those birds—was mentioned as being a structure designed to protect the breast from water, these birds frequently standing with the bare part of their legs quite immersed, so that, when they stretch out the neck to seize a fish, the body was often bent very much forward, and the water would consequently chill the chest, were it not defended by this peculiar structure, which was quite impervious. Mr. BLYTH discussed at considerable length the long-contested question of the intent of pectinated claws of birds, detailed the various opinions which had been brought forward on the subject, and argued that no animal was furnished with express means of ridding itself of its parasitic annoyance, however it might make use of structures designed for quite another purpose. He contended that the pectinated claw was for detaching fish scales or Beetles' claws that had adhered to the sides and corners of the mouth.

Mr. VIGORS, M.P., congratulated the Society on the great accession of talent it had gained, in allusion to the interesting observations which had been made by Mr. BLYTH.—He rejoiced that such a Society had been established, as it would doubtless lead to inquiries highly interesting to ornithologists.—Matters in themselves apparently trifling had conduced to the illustration of great and important results. A hundred times he found that a research after minor characters, which were calculated to escape the eye of common observation, carried out truths highly interesting.—The clump of feathers on the head of an Owl, the claws upon their feet, had led to serious investigations, pointing out the aim and end of the functions thus developed, and shewing their adaptations to the great objects of their Creator. The aigrette, for instance, in the modifications of the greater number of Owls, and the disk of the eye, are peculiarities assigned to them to direct them in their nocturnal researches for their prey.—He then

commented on the peculiar features of the Toucan and Nightjar groups, and pointed out the great analogy that existed between raptorial birds and carnivorous quadrupeds. The Vulture preys by its scent, and is furnished with a fleshy caruncle, which is subservient to its sense of smell. The Falcon secures its prey by sight, and this organ of vision is accordantly powerful; the Owl by hearing, and that bird is equally remarkable for the complicated structure of its ear, to which the aigrette is designed to collect and confine the sound.—The Canine and Feline race of quadrupeds, Mr. Vigors remarked, also possessed similar faculties by which they secured their prey.—The next analogy alluded to was that between the bills of the Snipes and Toucans, the former using it for probing the soft mud, and the latter likewise employing it for probing, but in a different manner.—The majority of birds which were cohabitants with the Toucans in the South American forests had elongated pensile nests, suspended from the extreme branches of trees, beyond the reach of Snakes and Monkeys. Nature had, however, appointed the Toucans to regulate their number, by providing them with a bill beautifully adapted for the purpose of inserting in those nests, and dragging forth the eggs or callow young.—Mr. Vigors then adverted at some length to Mr. Blyth's observations on the pectinated claws of birds, and concluded with a eulogium on that gentleman's valuable information, more particularly as regarded the connection between the eye-lashes and rostral protuberance of the Hornbills and the *Crotophagæ*, and requested Mr. Macleay to communicate his own personal observation on the latter.

Mr. Macleay then rose and remarked it would be presumption in him, after the interesting discussion which had taken place, to add any observations.—From his long residence in the West Indies, he had frequent opportunities of studying the habits of *Ani*. It is a bird extremely sensitive of cold, and does not live in captivity, even in that climate, unless kept by a fire; they usually congregated in considerable numbers, like the Tit, and thus obtained additional warmth. On dissecting the bird and closely examining the stomach, he found it contained a portion of animal food. He considered the eye-lashes protected the sight (in the manner stated by Mr. Blyth) when passing through the briars. He then called attention to a highly interesting fact, which he had lately discovered, and which furnished an exclusive definition to the great order of *Insessores*, or Perching birds, allowed on all hands to be a natural group, but which had hitherto baffled the ingenuity of naturalists to define satisfactorily. The character to which Mr. Macleay had alluded was one common and peculiar to the Insessorial order, viz. —that their young are hatched naked or callow.

Mr. Blyth again rose, and stated that the same character had also occurred to him, as Mr. Yarrell and many other naturalists were aware, but he pointed out certain exceptions to exist, as the *Caprimulgidæ* on the one hand, among

the *Insessores*, and the Cormorants on the other, which were hatched quite naked, not being *Insessores*.—In the first case, the reason why the *Caprimulgidæ* were excluded covered with down was sufficiently obvious, when we remember that these birds were hatched on the bare ground, without any preparation or nest, in consequence of which no care of the parents could suffice to prevent them from perishing, were they excluded otherwise. Mr. VIGORS thought that the *Caprimulgidæ* scarcely constituted any exception at all, as they stood at the extreme limit of the *Insessores*.

The second General Meeting of this Society for the present session was held at the rooms on Friday, Dec. 1, HARRY CHESTER, Esq., in the Chair.

The Report of the Council announced that the Hon. W. T. T. FIENNES had most liberally offered to place in the custody of the Society during his life, and at his own risk, the whole of his very valuable collection of stuffed birds, 500 specimens, mounted in cases. The Council had accepted this most liberal offer, and hoped that the collection would shortly be exhibited in the rooms of the society, where it cannot fail to prove highly valuable, by furnishing it with the means of promoting efficiently many of its important objects.—Since the last meeting Viscount BOYNE, T. B. LENNARD, Esq., FREDERICK BECKFORD LONG, Esq., the Rev. JOHN JENNINGS, and several other members, have been elected.—During the last month the Council have not been able to obtain any new specimens for the collection of live birds in St. James's Park.—The society has already a valuable collection of British *Anatidæ*.—The birds are generally in a very healthy condition, and the extent of the water on which they are located enables them to be seen in a natural state.—All the more ordinary *Anatidæ* having been already procured, the Council are anxious to make exertions for obtaining additions to their stock of rare and unique specimens, trusting that the support of the public will enable them to meet the expenses necessary for this purpose.—Mr. BARTLETT made some interesting observations on the various species of Gulls, and Mr. BLYTH on the close affinity of particular species of the Mealy Linnet, and the meeting adjourned.

MEDICO-BOTANICAL SOCIETY.

Earl STANHOPE, Pres., took the chair on Wednesday, Nov. 22.—After the routine business Prof. JOHNSON read a desultory paper, regretting that the Society had not met with the support nor reached the high station it deserved. Though known and recognized, the labours of the Society were little appreciated by the larger proportion of the metropolitan *literati*. Whence is this? Why is not the importance of the branch of science the object of their pursuits more felt by the majority of the men in practice? Because physicians are too much the

slaves of circumstances, journeying in the beaten path, applying remedies by statute; not investigating Vegetable Physiology; because general practitioners obtaining their chemicals and foreign drugs from Apothecaries' Hall, and their simpler medicals from Covent-Garden, consider it superfluous to pursue such investigation, not reflecting on the different properties, and their altered seat, in the same plant at different times—now in the root, then in the foliage, and then in the flower and seed; nor on the temptation of a great demand to substitute the plant gathered at improper seasons; and because the compounder feels no interest, no responsibility attaching to him, the mere trader cares not for such knowledge. How much, however, do such attainments raise their possessor above the common members of the profession! To facilitate the acquirement of extensive knowledge, how desirable is the division of labour, how advantageous the co-operation of numbers! Mr. JOHNSON called upon the practitioner to reflect what numbers were rushing to the Temple of Knowledge, now open to all, with no longer Mystery for porter. What was the object of this Society's investigation? Respite from pain and death.—The Chairman coincided with the learned professor, commented upon the immense advantages of exploring the medicinal qualities of plants, the nature of therapeutic agents; and mentioned a few of the numerous and valuable additions to the materia medica by the labours of the society whose records abound with similar instances. An interesting discussion ensued on the qualities of the different Sennas, as imported from Alexandria, from Tripoli, and from the East Indies, the change in its efficacy by the mixture of leaves and stalks, &c., in which Drs. FARR, MACREIGHT, SIGMOND, and others took part.

LINNÆAN SOCIETY.

Nov. 21.—A letter was read from the Duke of SOMERSET, resigning his appointment of president, which he has held since the resignation of the Earl of DERBY in 1833. A special meeting was appointed for Saturday, Dec. 2, for the choice of a successor, who, it is understood, will be Dr. STANLEY, Bishop of NORWICH, who, in addition to his other high intellectual acquirements, is well-versed in the different branches of Natural History. An address of congratulation to her Majesty, with a request that she would become the patroness of the Society, was also agreed to; and it is an interesting coincidence, according to *The Atlas*, that the anniversary of the Queen is that of the immortal naturalist after whom this Society is named.

ZOOLOGICAL GARDENS OF CHELTENHAM.

The Zoological Gardens have, within the last six weeks, made rapid progress. A large portion of the lake has been excavated, and many of the surrounding

walks and embankments completely formed, and the planting is now being proceeded with from the entrance up to the proposed conservatories, and on either side the grand promenade. From what has already been done, and the various works now in progress, it is evident the committee of management, when called upon for their report in January, will be able to give such an account of their stewardship as cannot fail satisfying the subscribers to the undertaking that there has been no lack of exertions on their part in carrying out the objects proposed by the society. We have just heard with much pleasure that R. CAPPER, Esq., has presented the Society with a donation of £20. We hope his example will be followed by others.—*Cheltenham Looker-On.*

ZOOLOGICAL SOCIETY.

The ordinary monthly meeting for general business was held Nov. 2, the Rev. JOHN BARLOW, F.R.S., in the chair.—Mr. YARRELL read the report of the council, which, on account of there being no meeting in the past month, embraced the affairs of the society since June. In the months of July and August the total amount of receipts was £2,424. 2*s*. 8d., and of expenditure, £2,025. The number of persons admitted to the gardens was 55,364, from whom £1,887 11s. was received; and to the museum, 496 persons, from whom £10. 9*s*. had been received. In the months of September and October the receipts were £1,653. 15s.; the number of visitors to the gardens, 27,463, from whom £1,058 8s. was received, and to the museum, 566, the sum received being £9. 11s. Various donations were announced to the menagerie, museum, and library departments, from the Prince of MUSIGNANO, Imperial Academy of St. Petersburg, Mr. AUDUBON, Major CAMPBELL, &c.; and the present stock in hand at the menagerie was stated as 1,032; or 284 mammalia, 725 birds, and 23 reptiles, being 12 less than at the last report. No works are at present in progress. Mr. VIGORS, M.P., having questioned the secretary as to the great deficiency in the Garden receipts over the corresponding period of last year, and being assured by him that they were short by no less a sum than £3,880, entered into his views as to providing some great additional objects of attraction by which the receipts might be maintained. For this purpose he suggested the carrying into execution the erection of a suspension-bridge, to communicate with the grounds of the society on the opposite side of the Regent's Canal, and the judicious erection of more extensive buildings, similar to those of other establishments in the country. The Chairman announced that the council had, the day previous, appointed a special committee on the subject of the deficiency in the Garden receipts. With regard to the introduction of new animals, a spirited attempt was being made to introduce two living Hippotami into the collection, and they had received a promise of a material addition to their number of Lions. Mr.

Vigors and other members having expressed their satisfaction at the intentions of the council, and several new members having been elected and proposed, the meeting adjourned.

The ordinary meeting was held Nov. 14, Mr. T. Bell, F.R.S., in the chair.—Prince Lucien Bonaparte read a paper on his new arrangement of fishes, established on characters which he considered preferable to the ordinary distinctions, arranging them in three great classes according to the form of the branchiæ, in five sub-divisions and twelve orders. Mr. Gray made some observations on the different species of *Sorex* (Shrews), premising them with some remarks on the importance of paying attention to the external characters of mammalia, which he considered would form better objects of distinction even than the teeth, the form and appearance of which were modified by circumstances. Mr. Blyth made some remarks on different distinctions of birds; and Mr. Gould exhibited two small collections of birds from Mr. Abbott, of Trebizond, and Mr. Hearne, of Haiti. Mr. Yarrell exhibited a large specimen of Whitebait, about six inches long, remarking that, although this fish was considered to be confined to the Thames, it was found in many of the other rivers of Great Britain, and that, although more seldom, this was to be ascribed to the mode adopted for catching it. A Latin description was read from Mr. Westwood of a collection of insects sent over by Mr. Cumming; after which the meeting adjourned.

BOTANICAL SOCIETY.

The ordinary meeting was held Nov. 16, at the new rooms of the Society, 75, Newman-street, Oxford-street, J. E. Gray, Esq., president, in the chair. A paper was read from Dr. Bossey, on the Fungi which produce the ergot in the Rye and other cereal grains, of which many specimens were exhibited. The president announced various presents, among which were specimens of *Goodyera albida*, from Mr. Robert Leyland, of Halifax, and of *Claytonia alsinoides*, from Mr. Baxter, of Oxford, found wild in a wood near Chatsworth; after which the meeting adjourned till the anniversary the 29th of November.

EXTRACTS FROM THE FOREIGN PERIODICALS.

BOTANY.

1. Introduction of the Culture of Rice in the Centre of France.—We have already (*Bib. de Gen.*, Nov. 1836, p. 193) incidentally announced this circumstance in an article relative to the naturalization of certain plants in

the neighbourhood of Montpellier (*Naturalist*, Vol. II., p. 487). The companion of the merchant of Montpellier of whom we have spoken now confirms the news, adding details worthy of attention. The following letter is inserted in an excellent publication entitled *Bulletin de la Sociéte d'Agriculture du Department de l'Herault*. December, 1836.

LETTER FROM M. VIALARS, SEN., ON THE ATTEMPTS TO CULTIVATE RICE, UNDERTAKEN AT MANDIÉRAC, PROVINCE OF AUDE.

It is true that the society of agriculturists has this year gathered Rice within the jurisdiction of Mandiérac. This trial proves that the culture might be carried out on a large scale, which will in fact be done next year; but it must be confessed that few localities are better fitted for the culture of Rice than Mandiérac. Its lands are marshy, and possess water in abundance to inundate such parts as are required for growing Rice.

It is an error too widely circulated that Rice-grounds injure the salubrity of a country. The countries where this culture has been introduced were originally marshy, and from this fact alone it ought to cause fevers. It may even be said, in favor of the Rice-grounds, that they destroy these marshes and drain the country; for instead of stagnant waters sending forth unhealthy miasmata, there is only fresh water. It is true that towards the period of the maturation of the Rice the grounds become dry, and that the neighbouring inhabitants are exposed to fever; but it is only what happens in our country on the borders of the marshes, and it has been ascertained that in Lombardy, where Rice is cultivated, the mortality is not greater than in any other part of the country where this culture has not been introduced.

It is evident that the first trial cannot give a precise idea of the result to be expected in future; but it is useful to ascertain that Rice sown in a salt country has flourished and produced seed. The Rice-grounds of Piedmont and Lombardy are not topographically more favorably circumstanced than those of the provinces of Aude and Hérault; the latter are even in a more meridional latitude, which may be an advantage, since, as every one knows, the kingdom of Valence, considerably south of us, produces Rice in abundance; but even supposing that the Rice-grounds of France produced less than those of the foreign country, we should have, with or without reason, the *droit protecteur* of 24 fr. in 100 kil., which would be advantageous to the proprietors of Rice-grounds, but detrimental to the consumer.

The experiment made by our society has been opposed by various circumstances independent of its control; next year we may probably obtain positive data respecting the produce of this culture, which I shall be happy to transmit to you.

Rivesaltes, *Nov.* 19.

The question regarding the influence of Rice-grounds on the public health has not yet been investigated with all the care it deserves, and independently of theories, prejudices and local interests. It should fall into the hands of an individual accustomed to collect the numbers of the population, and to weigh them with a degree of judgment which is not common, and of which we find examples in the writings of PARENT DU CHATELET, VILLERMÉ, or BENOISTON DU CHATEAUNEUF. Since the time when M. JULIO, Prefect of the ancient province of Sesia, reported on the mortality of the Rice-grounds of the neighbourhood of Verceil, and when M. DE CANDOLLE gave a correct extract in his returns addressed to the minister of the interior, that department of statistics in which the advances of population are noted has made considerable progress. The mortality as compared with the population has been acknowledged insufficient to express the physical condition of nations: it depends too much on the proportional number of births. The longevity of old men is an exception which rather proves a great destruction of young and less vigorous men. The number of *centenaires* (individuals a hundred years old) is almost in an inverse ratio of the average length of life to which we should attend, correcting all the numbers by an attentive examination of the emigrations and immigrations of each locality. The proportion of names properly and improperly entered, as well as the mean stature of the individuals at the time when the growth is always completed, that is at the age of twenty-eight or thirty, are considerations by means of which the salubrity of a country should be ascertained.

The Sardinian government has established a statistical committee, the members of which give us hopes of a work worthy of confidence. We understand that they propose particularly examining the mortality of the Rice countries of Piedmont.

As regards the shore of the Mediterranean in the south of France, the question is much more simple. This long line of marsh is already unwholesome and little productive. The culture of Rice cannot greatly increase the number of fevers, already considerable, and assuredly it should enrich the people, give them better clothing, better habitations, more substantial food, which necessarily has a favorable effect on health. Moreover, this part of France does not grow much Corn. It is obliged to procure provisions from a distance, and will therefore gain by the introduction of a culture which will perhaps afford the greatest quantity of food which can be produced in a given space.—*Bibliothèque Universelle de Genève, Nouvelle Série.*

2. FOOD OF THE HORSE.—M. FÉLIX VOGELI of Lyons published in 1836, in one octavo volume (Paris: ANSELIN), a work entitled, "*Flore Fourragère, ou Traité complet des Alimens du Cheval.*" The first part, observes a French journal from whose pages we have frequently quoted, treats of the ordinary food of

the Horse, considered with respect to their natural history and nutritive properties. The author passes in review the various families of plants admitted by Jussieu. He indicates the species which grow in France, in the meadows, and their value as food. In the second part he speaks of the different operations which the plants used as food undergo before being given to the animal. Lastly, he enumerates the articles proper to be given to Horses, but which do not form their customary food, as the leaves of trees, roots, tubercles, &c.—*Bib. de Genève, Seconde Année*, *p.* 208.

3. Sleep of Flowers, by M. Dutrochet.—Some flowers wake but once, namely, on their expansion, and have but one sleep, which immediately precedes the death of the corolla; such are the flowers of *Mirabilis* and *Convolvulus.* Other flowers present, during many days, the waking and sleeping states alternately, as, for example, the flower of the Dandelion (*Leontodon taraxacum*). These are the flowers which I have chosen for my observations.

The flowers of *Mirabilis jalappa* and *Mirabilis longiflora* open their infundibuliform corollæ in the evening, and close them on the morning of the following day. This flower may be considered to be formed by the junction of five petals which each possess their median line. The five nerves which sustain the membranous tissue of the corolla, as the whalebone of an umbrella supports the silk, are the sole agents of the motions which effect the expansion of the corolla, and its closing or sleep. In the former case the five nerves curve so as to direct their concavity outwards; in the second case they bend in such a manner as to direct their concavity towards the interior of the flower, and they thus carry with them the membranous tissue of the corolla to the orifice of its tubular canal.

Thus the same nerves successively execute at two different times two opposite kinds of curvature. I have examined the internal structure of these nerves in the microscope; they possess externally acellular tissue the cells of which, disposed in longitudinal series, principally decrease in size of the interior towards the external surface, so that at the time of the turgescence of these cellules the tissue which forms them curves in such a manner as to direct its concavity outwards. It is that, therefore, which effects the expansion of the corolla, or its awaking. On the interior surface of each nerve exists a fibrous tissue composed of transparent fibres, extremely fine, and intermixed with globules arranged in longitudinal series. This fibrous tissue is situated between a surface of tubes on one hand, and a surface of superficial cells filled with air on the other; so that it is placed between two kinds of pneumatic organs.

I separated by a longitudinal section the cellular and the fibrous tissue which compose the nerve, which I immediately plunged in water. The cellular tissue is curved towards the outside, the fibrous tissue towards the interior, of the

corolla. These two inverse curvatures are invariably observed. Thus it is undoubtedly the cellular tissue of each nerve, which, by its incurvation, effects the awakening of the corolla, and it is the fibrous tissue which, by its incurvation in an opposite direction, occasions the sleep of the corolla.

I separated a nerve from the corolla of *Mirabilis*, still in bud and about to expand; I plunged it in water, and it curved powerfully *outwards*, thus taking the curvature which effects expansion or awakening. I transferred it into a syrup of sugar: it curved in the opposite direction, or *inwards*. This proves that in the first case there was turgescence of the cellules, the external water being conveyed, by endosmose, towards the organic fluid which existed in the cellules, and that in the second case there was depletion of the cellules; because their organic fluid, less dense than the external syrup, flowed towards the former. It might be concluded, since the expansion of the flower is owing to the turgescence of the cellular tissue of its nerves, that its closing or its sleep was due to depletion of the same cellular tissue; but experience proves that such is not the cause of the sleep of the corolla.—[The learned author of the paper then proceeds to offer his reasons for this statement, which, however, we must defer to a future occasion. We hope to extract further from the article in an early number.—Ed. *Nat.*]—*Annales des Sciences Naturelles.*

4. On the Corolla of *Cistaceæ*, by M. Edouard Spach.—The corolla (absent in some species) possesses only one whorl of petals, sometimes opposite to, sometimes alternate with, the sepals, and always distinct.

When the petals are five in flowers with five, four, or three sepals,* they never alternate with the sepals, as had been supposed till this time; but in neither case do they offer any regular or constant symmetry relative to the calyx.†

When there are three petals,‡ they alternate with the three sepals of the inner whorl.

In the order *Cistaceæ* the petals, without exception very deciduous and inserted on the receptacle under the disk, are folded before the flowering, and turned in the opposite direction from the inner sepals.

In the order *Lechidaceæ* the petals are in general more or less persistent, and even grow a little after flowering. They are neither twisted nor rumpled in æstivation, but simply imbricate, and are inserted at the base of a stiptiform receptale, or, occasionally, at the summit of this stipe. In some species of the

* This formation is common to the majority of the species, and, with some other characters, it constitutes M. Spach's *Cistaceæ*.

† M. S. has arrived at this conclusion by the examination of a large number of species.

‡ The tripetalous and apetalous *Cistaceæ* constitute our author's *Lechidaceæ*: all have a pentasepalous calyx.

same order the primordial flower of each inflorescence is generally five-petaled, while all the other flowers are apetalous.—*Annales des Sciences Naturelles.*

CHAPTER OF MISCELLANIES.

ZOOLOGY.

The Common Kingfisher (*Alcedo ispida*) shot near St. Andrews.—A specimen of this pretty little bird (which you have figured so beautifully in Nos. xiii. and xiv.) was shot here in 1834, on the banks of the Kinnesburn, by the miller who lives at the side of the stream. The specimen, which I wished to purchase, is still in his possession.—Henry Buist, *Law Park, near St. Andrews, Nov.* 14, 1837.

Partridges.—The *Woodstock* (Virginia) *Sentinel* of Nov. 2 says:—"Partridges are so numerous in our vicinity that they have actually marched into the stores of the village, offering themselves up willing sacrifices to the delighted merchant. There is scarcely a garden in town where they are not to be found; and one morning this week we saw several sitting upon the market-house of this place."

Frog sitting on a Fish's back.—When walking in the spring of the present year by the side of a large fish-pond near Loose, in the vicinity of Maidstone, I observed a person looking very intently at something in the water. On inquiring what had arrested his attention, he replied that he had seen a most extraordinary sight—no less than a large Frog sitting upon the back of a fish, the latter swimming about very slowly with its burden. He pointed out where he last saw it, but a ripple caused by the breeze prevented my seeing it. I should certainly have been very doubtful of the truth of the man's story had I not seen in the *Complete Angler* the following curious account of a similar circumstance, related by "Dubravius, a bishop of Bohemia," who "saw a Frog when a Pike lay, very sleepily and quiet, by the shore-side, leap upon his head; and the Frog, having expressed malice or anger by his swollen cheeks and staring eyes, did stretch out his legs, and embrace the Pike's head, and presently reach them to his eyes, tearing, with them and his teeth, those tender parts; the Pike, moved with anguish, moves up and down the water, and rubs himself against weeds, and whatever he thought might quit him of his enemy: but all in vain, for the Frog did continue to ride triumphantly, and to bite and torment the Pike, till his strength failed; and then the Frog sank with the Pike to the bottom of the water: then, presently, the Frog appeared again at the top; and croaked, and

seemed to rejoice like a conqueror; after which he presently retired to his secret hole. The bishop that had beheld the battle, called his fishermen to fetch his nets, and by all means to get the Pike, that they might declare what had happened. And the Pike was drawn forth; and both his eyes were eaten out,—at which they began to wonder; the fishermen wished them to forbear, and assured them he was certain that Pikes were often so served."

I can by no means agree with the bishop's opinion of the Frog's tearing out the Pike's eyes. May we not suppose that the fish's eyes were either out or approaching to blindness before the Frog got upon its back? The fact of their being frequently caught by fishermen with their eyes out seems to agree with this.

I can depend upon the veracity of the person who told me he saw the Frog upon the back of a fish,* seated, as he said, upon the nape of the neck, the hind legs clinging round the body, and the toes of the fore legs close to the gills. I can imagine no other motive for this circumstance than its being the season of impregnation. The Frog in question was a male, and had placed itself upon a sickly fish, instead of upon an animal of its own kind.—W. H. Benshed, *Maidstone, Nov.* 6, 1837.

Anecdote of a Robin Redbreast.—I obtained the following fact, many years ago, from the owner of the premises at Plymouth. Early in winter a Robin was seen to frequent a Mulberry-tree close to the window of the late Mr. Haydon's† printing-office in that place, where it sang very sweetly. The workmen opened the window, and at length the bird flew in, and, being fed, did not seem at all uneasy in its new situation. It sang almost daily, generally in the morning and evening, wholly disregarding the operations of the workmen, and apparently well satisfied with its new companions, until the following spring. The window being opened at this season, it flew away, but, singular to say, returned to the tree at the approach of winter, and was again received into the office, where it took up its old station till the following March. Some of the workmen would not believe that it was the same bird, and one of them, having caught it, marked the breast feathers under the throat, with printing-ink. The next spring came, and the bird took its departure as before, returning again, at the end of September, to the old Mulberry-tree, with several other birds of its kind. The window was quickly opened to the welcome old songster, when it flew into the office, followed by two other birds, probably its young. It displayed greater familiarity than before, even perching on the caps of the men, and there singing. It need not be remarked that it was ascertained to be the same

* Mr. Benshed before stated, that he "should certainly have been very doubtful of the truth of the man s story" had he not met with the above quotation from Isaac Walton.—Ed.

† The father of the well-known artist.—Ed.

bird.* A strange Cat one night during this third winter got into the office and killed the old Robin and its two companions, whose remains were found by the workmen on the following morning. The murderer was captured, and, it need scarcely be added, put to death, being hung on the Mulberry-tree upon which the favourite of the workmen had been first heard warbling its cheerful notes.—C. Redding, *Lichfield*, *Nov.* 20, 1837.

Query respecting the Prize-essays on the Turnip Fly.—If in your next number you would inform a constant reader of your magazine how soon the prize essays on the Turnip Fly—respecting which advertisements appeared in the newspapers some time ago—should be sent in, and to whom, and whether there are not to be more than one, I should feel very much obliged to you. As, for obvious reasons, my name should not appear, I will subscribe myself—Philander.—[*Postmark Doncaster, and received Dec.* 16, 1837.]—[We are not aware, but have made inquiry in more than one quarter. In case any correspondent favours us with a reply in a few days subsequent to publication, how shall we address Philander?—Ed.]

Deaths from Eating Funguses.—On Saturday last three inquests were held at Chippenham, on view of the bodies of R. Burroughs, two years and a half old, who died on the 27th ult., his mother Mary Burroughs, aged thirty-two, and her niece, Mary Ann Burroughs, aged four years and eight months, both of whom died on the 29th ult. From the evidence of the different witnesses, and the *post mortem* examination of the bodies, it appeared that the deaths of all three were occasioned by their ignorantly eating some poisonous Funguses resembling Mushrooms. The jury returned verdicts accordingly.—*Cambridge Chronicle*, *Sept.*, 1837.—[Were this part of the vegetable kingdom more accurately studied, and were popular writers on Botany to furnish plain directions for distinguishing the wholesome from the poisonous plants, the number of these now too common accidents might be materially diminished.—Ed. *Nat.*]

Female Ourang Outang.—Information was conveyed to the Zoological Society in the latter part of last week, that a living female specimen of the Ourang Outang, or wild man of the woods, had been landed at Plymouth, and immediate steps were taken to secure so valuable a prize for the gardens. The Ourang reached London on Saturday, and a bargain having been struck with the sailor who had been so fortunate as to succeed in keeping her alive on the voyage fron Borneo, she was in a few hours transferred to safe quarters in the Regent's Park. Notwithstanding the confinement and fatigue of a five months' voyage,

* That the bird was the same we have no doubt; but we are at a loss to conceive how the marking the plumage with printer's ink could ascertain the point, since the usual moult must have taken place between the departure and return of the bird.—Ed.

the creature appears in good health and spirits, and will probably prove as great a source of attraction as the Chimpanzee.—*Morning Post, Nov.* 1837.

Sagacity of a Horse.—Last week, two Horses belonging to Mr. Ibbotson, of Dungworth, were turned into a pasture in which there was a pit four yards deep; shortly afterwards, Mr. Ibbotson observed one of them to be very uneasy, frequently running to the gate and trying to get out of the field. Thinking that the Horse wanted to get under cover, as it was hailing very fast at the time, he went to open the gate, where he was met by the Horse, which began neighing very loud, and then gallopped to the mouth of the pit. Mr. Ibbotson was attracted to the place, where he discovered the other Horse at the bottom; assistance was immediately procured, and Smiler was released from the awkward predicament in which he had fallen, without having sustained any injury. The other, on seeing his companion in a fair way for being liberated, started for home at full speed.—*Sheffield Iris, Nov.*, 1837.

Curiosities in Natural History.—A fine Hare, curiously marked, shot a few days ago by George Broadrick, Esq., on his estate at Ellerholme, near Wroot, Lincolnshire, is now in the hands of Mr. Reid, of this town, for preservation. The animal has four white feet; the fore legs, breast, and part of the shoulders are perfectly white, and a narrow white streak or band extends from each shoulder completely across the back, forming a complete ring.—Mr. Reid has also in his possession a perfect specimen of the Promerine Gull [the Pomerine Skua, *Lestris pomerinus*, is the bird alluded to.—Ed.], shot a short time since near Thorne. He has likewise, among numerous other curiosities, a beautiful Purple Tringa (*Tringa purpurea*), lately shot at Dinnington, near Worksop, by J. C. Athorpe, Esq.—*Doncaster Gazette, Dec.* 1, 1837.

Habits of the Spring Oatear (*Budytes flava*).—The question respecting the habits of *Budytes flava* (Vol. II., pp. 103, 294, 422) can only be settled by observation. Mine certainly agrees with that of Mr. Salmon, as this species, on its arrival here, resorts to the banks of the river Mersey, where during the spring numbers may continually be seen busily engaged in seeking for food. The same station is also frequented by *Motacilla maculosa*, the Pied Wagtail. This latter species seems rather to prefer the margins of ponds in the vicinity of farm-houses, &c.—Peter Rylands, *Bewsey House, near Warrington, Dec.* 4, 1837.

Reply to Observations by Peter Rylands, Esq.—In reply to Mr. Rylands (Vol. II., p. 361), in Dr. Pulteney's Catalogue I find the following passages:—"*Procellaria puffinus*, the Shearwater Petrel, Pen., No. 258; Edwards, 359; Lewin, I., No. 218. I cannot from my own inspection ascertain that it is this bird, but from the descriptions received of it I can but little doubt it; and the same bird frequents the high cliffs of Purbeck and Portland."—"*Anas fuligula*, Tufted Duck, Penn., No. 274, Lewin, No. 257. Shot at Bryan-

stone, &c., in great plenty, 1795." As regards "*Mergus cucullatus* (258) 263," I cannot explain without seeing my MS. Qu., "*M. castor*, Dun Diver (?), common near Poole and Wareham," and "several near Blandford, 1776."—J. C. Dale, *Glanville's Wootton, Dorsetshire, Nov.* 3, 1837.

Rough-legged Buzzard (*Falco lagopus*) near Scarborough.—We now and then receive a visit from this very able forager. A few specimens have recently been entrapped in the Rabbit-warrens about Hackness. The keepers find it destructive amongst game. It also seems to possess a very lickerish tooth, preferring the *young* game.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

White Variety of the Garden Ouzel (*Merula hortensis*).—Mr. John Turle, animal-preserver of this town, has in his possession a curious species [*variety*.—Ed. *Nat.*] of the Blackbird, the plumage of which is perfectly white. The bird had been seen in the neighbourhood of Churchingford for the last two or three weeks; various arts were in vain tried to take it alive, and it was at last shot. It is a remarkably fine male, with beautiful yellow bill and legs.—*Taunton Courier*.—[We are, in law-phrase, much indebted to the "person or persons unknown," who forwarded us the newspaper containing the above notice; but probably the said individuals are not aware that a fine is imposed for making crosses or marks of any kind inside a newspaper transmitted by post. No fear need be entertained that we shall overlook these paragraphs in the papers we receive.—Ed. *Nat.*]

On Toads being found imbedded in Stone.—In looking over your last number (Vol. II., p. 450), I noticed an account of a Toad being found alive imbedded in a quantity of dislodged limestone. By the term *dislodged* limestone I suppose is understood fragments of stone lying together, and the Toad found in the middle or at the bottom. Taking this to be the case, I do not think it very extraordinary, considering the habits of the animal. I have a limestone quarry in the lower green sand at Maidstone, worked to the depth of eighty feet, and in the lowest strata are many cracks and fissures, in which I have frequently seen several young Toads, and a small species of Lizard or Eft. The Toads are very little larger than a shilling, and seem to live entirely in the situation mentioned. There is no communication upwards for air, as the beds of stone are covered with loam and gravel; but as some of these cracks are old water-courses, there is most likely a circulation of air through them. I think they are a different species from the Common Toad. Their colour is chocolate brown. I believe no authentic instance of a Toad imbedded in *solid* stone is known, at least in any of the old formations containing fossils of a marine origin; but that they have been found enveloped in dislodged fragments with sand, &c., hardened around into a substance like stone, is probable. My opinion is, that

it is an impossibility for a living animal to support the enormous pressure which the deep-seated rocks or beds of limestone have undergone ; and the inconsistency of a Toad being associated with marine exuviæ is so great that I cannot imagine its occurrence.—W. H. Benshed, *Maidstone, Nov.* 6, 1837.

Snowy Owl (*Surnia nyctea*) shot in Dorsetshire.—Our esteemed correspondent Mr. Dale informs us, in a communication dated Dec. 12, 1837, that a Snowy Owl or Surn has been shot at Langton, near Blandford, by J. J. Farquharson, Esq., but at what period is not stated.—Ed.

Capture of an Eagle by a Boy.—A few days ago an Eagle was discovered on Thwaites Fell, near Broughton-in-Furness, by a boy of the name of Jackson, of Swinside. The Eagle being on a low or level ground, was unable to rise, and the boy, after a "hard siege," brought home the vanquished bird, though not without the usual tokens of war amongst boys,—viz., tattered garments. The Eagle, which is a remarkably fine one, and of a large size, is now in the possession of John Lewthwaite, Esq., of Broadgate.—*Kendal Mercury.*

Capture of a Whale.—A fine young Whale, about 21 feet in length, was caught near the shore, between Newlyn and Mousehole, on Saturday last. Some fishermen of Newlyn, who discovered this monster of the deep, went out in a boat, and were successful in fixing a small anchor in his blowing-hole, by which means it was drawn to the shore. It exercised its tail tremendously in the water, and would have smashed the boat to pieces if it had been within reach of the blows.—*West Briton.*

[The value of these two communications would have been greatly enhanced had the species been mentioned in both cases. At present they are of comparatively little use to the naturalist.—Ed. *Nat.*]

Addition to Mr. Dale's Catalogue of Dorsetshire Coleoptera.—To my former list I have to add, li. Pœcilus.—5. *erythropus.* Portland, May, 1837.—*Pogonus Burrellii.* Charmouth, Sept., 1837.—*Forficula*, a new species (?) without wings. Charmouth, Sept., 1838.—*Peronea umbrana.* St. Caundle, Mr. Serrell.—*Tephritis guttularis.* G. W.—*T. Westermanni.* Charmouth.—*Leia pulchella.* G. W.—*Gonia auriceps?* Portland, May, 1837.—*Teichomyza fusca.* Blandford. November & February!—*Chyliza leptogaster.* —*Ocyptera interrupta.* Knighton Heath.—J. C. Dale, *Glanville's Wootton, Dorsetshire, Nov.* 3, 1837.

Large Ray found off Feroe.—In October last an enormous Ray-fish was found off Feroe, which weighed 384 pounds, was 13 inches thick, 8 feet 8 inches long, and 6 feet 2 inches wide.—Ed.

On Changes of Colour in the Plumage of Birds without Moulting. —The inclosed skins of two female Whin Chats are excellent specimens of the immense seasonal change which takes place in the plumage of several of our

native birds without *moulting* a feather. I propose to term this their summer and winter *aspect*, as opposed to their summer and winter *plumage*, which latter expression should be limited to actual change of feather, as in the Pipits, Pied Flycatcher, &c. One of the birds I send you was shot in summer before moulting, the other in autumn, after its autumnal change; the spring aspect is of course intermediate. The same change is exhibited in all the other Chats, in the Redstarts, Fantails, Larks, and in the other Buntings and *Fringillidæ* (or birds of the Finch family); in short, I think I may say in all our native Fringillidous species, with the exception of the Haw Grosbeak. The Siskin shews it very remarkably. Yet this wearing off of the extreme edgings of the feathers has almost escaped the observation of our naturalists! Observe the difference in the larger feathers; you will find this to be a capital test of whether an Insessorial bird moults once or twice in the year, and you will perceive from this that the Grey Flycatcher moults but once, and the Pied species twice—a fact which I have otherwise ascertained. The Shrikes also moult twice in the year.—Edward Blyth, *Tooting, Surrey, April* 6, 1836, *in a letter to Neville Wood, Esq.*

Haunts of the Darklegged Warbler (*Sylvia loquax*, Herbert).—In riding over a considerable extent of country the other day, I noticed that the Darklegged Warbler is rather more an upland bird than its musical congener the Willow Warbler; for I observed that on the hills the former very much predominated, while the latter was considerably more abundant in the vallies—a fact which I never remember to have noticed before.—Edward Blyth, *Tooting, Surrey, April* 21, 1836, *in a letter to Neville Wood, Esq.* [We think this circumstance requires further confirmation before it can be considered a fact.—Ed.]

The Land Crab of Jamaica.—This species of Crab (*Cancer ruricola*), at one time very abundant, and still common in less densely peopled or uninhabited islands, is found inhabiting holes upon the highest hills and mountains in the West Indies. When the season for spawning arrives, vast armies of them set out from the hills, marching in a direct line towards the sea-shore, for the purpose of depositing their eggs in the sand. On this grand expedition nothing is allowed to turn them from their course. With unyielding perseverance they surmount every obstacle which may intervene, whether a house, rock, or any other body, not avoiding the labour of climbing by going round, but ascending and passing over it in a straight line. Having reached the destined limit of their journey, they deposit their eggs in the sand, and recommence their toilsome march towards their upland retreats. They set out after nightfall, and steadily advance, until the advance of daylight warns them to seek concealment in the inequalities of the ground, or among any kind of rubbish, where they lie ensconced until the stars again invite them to pursue

their undeviating course. On their seaward journey they are in full vigour and fine condition, and this is the time when they are caught in great numbers for the table. Their flesh, which is of the purest whiteness, is highly esteemed, but, like that of all crustaceous animals, is rather difficult of digestion. Returning from the coast, they are exhausted, poor, and no longer fit for use. They then retire to their burrows, and slough, or shed their shells, after which operation, and while in their soft state, they are again sought by epicures. Seeing they are so much valued as an article of food, it is not surprising that their numbers should be exceedingly diminished, or quite extinguished, in populous islands, where multitudes are annually consumed, before they have deposited their eggs for the continuance of the species. Besides this cause of diminution, they are destroyed in great numbers by other animals, and numbers of them perish from exhaustion and injury on their homeward progress. When the eggs are hatched, the young in like manner seek the hills, and pursue the course of life peculiar to their race.—*Sheffield Iris*, *Oct.* 24, 1837.

BOTANY.

An Apple, grown by James Nosworthy, of St. Sidwell's, Exeter, was last week plucked from a tree in his garden, of the extraordinary size of 17½ inches in circumference, and weighing 1lb. 3½oz.

Large Apple.—We have seen an Apple sent to Mr. Graham, farmer, Masthaugh, from the state of Cincinnati, in America, which weighs upwards of a pound and a half! It is of the species called the Green Pippin, and has a peculiarly pleasant smell; when fresh from the tree, it must have weighed at least two pounds. It is now in the shop of Mr. Turnbull, seedsman, George-street. —*Perth Chronicle.*

Large Cabbage.—There is to be seen growing at Aislaby Hall, in the garden belonging to the Rev. Thomas Hayes, a Cabbage, produced from one seed, which measures in circumference 22 feet 7 inches, and stands 5 feet 6 inches.

An Extraordinary Turnip.—Last week, a Turnip of the common white stone kind, was taken up in the field of Mr. Thomas Park, of Pickering, which measured 42 inches in circumference, and weighed 21lbs. It is allowed by several persons who have seen it to be the largest ever seen in that neighbourhood.

Remarkable Produce.—A Potatoe weighing 12 ounces, and having eleven eyes on it, was cut into eleven sets and planted in a garden at Harewood, on the 16th of May last, and the produce was taken up on the 4th of December, when there were three hundred in number, besides some small ones about the size of Walnuts. The 300 weighed 9lb. 12oz.

Enormous Turnip.—Among the various Turnip crops produced within this county (Yorkshire), there are few that will be found to vie with one grown by Mr. William Swale, of the White Swan Inn, Middleham, on a part of the estate of Col. Wood, of Middleham Parks; the balls of the Turnips completely cover the ground, which may literally be said to groan under the weight of them; one selected almost at random, weighs the enormous weight of 25 pounds, is two feet nine inches in circumference, and the length, including the top, is three feet ten inches. There appear to be many in this heavy crop of Turnips of a still larger size.

[The above communications are interesting in as far as they prove the enormous size to which various fruits and vegetables employed as food may be grown; but how far their *quality* is improved, is very questionable. That skilful culture *might* cause size and quality to go hand-in-hand, is, however, sufficiently probable.—Ed. *Nat.*]

Propagation of Apple-trees.—A new plan for increasing plantations of Apple-trees has lately been carried into extensive practice by the inhabitants of Bohemia. Neither seed nor grafting is required. The plan is to take shoots from the best sorts, insert them in Potatoes, and plunge both into the ground, leaving an inch or two of the shoot above the surface. The Potatoe nourishes the shoot, while it pushes out roots, and the shoot gradually grows up and becomes a beautiful tree, bearing the first fruit without requiring to be grafted. Whatever may be the success of the undertaking, its novelty at least is an inducement to give it a fair trial.—*Quarterly Journal of Agriculture.*

Result of cutting down Forests.—M. Devèz de Chabriol, in a memoir treating of the effects arising from the extirpation of forests, cites several historical documents, all tending to establish the fact that the temperature of a country is not only lowered by the taking away of the trees, but that streams dry up, and rain ceases to fall. M. Boussingault confirms these by several instances, where lakes have been diminished in consequence of cutting down the neighbouring woods, and the water restored to its former level by suffering the trees to grow again; also where the quantity of water has always remained the same when the woods near it have been left untouched. M. Boussingault states that in some of the provinces of South America which are covered with wood it rains every day; and in others, where the soil is sandy and arid, it never rains; yet these provinces have the same latitude and climate, and the projections and distances of mountains are nearly similar.—*Aug.* 19.

MINERALOGY AND GEOLOGY.

Remains of Mammalia.—The remains of Mammalia have been found on the plains of Cheshire. In the progress of cutting for the Grand Junction Railway, two grinders of the Elephant were discovered in a bed of gravel replete with marine shells.

Minerals in Jamaica.—The expectations of the Spaniards, which appear to have been disappointed on the first discovery of Jamaica, by Colombus, with respect to its mineral riches, seem to be on the eve of being realized, after an interval of more than three centuries, in our days; specimens of copper, gold, silver, lead, and iron ores, of great beauty and richness, having been received in this country from an estate in the vicinity of Kingston. The copper ore is said to yield fifty per cent. of pure metal, and hence appears to be the richest in the world: and a cargo of copper ore, shipped from an estate in the parish of St. George, sold as high as £40 per ton. Besides this a discovery of coal, of excellent quality, has also taken place, and promises to be of vast advantage to the inhabitants.—*Sheffield Iris.*

Interesting Remains.—In excavating for the line of the Great Western Railway, in a field close to the Cross Post Turnpike, on the Bristol road, the workmen have discovered some very extensive remains of a Roman villa. The foundations have been laid open, so that it would be very easy to form a tolerably correct ground-plan of the building. Two tesselated pavements were discovered, but they were, unfortunately, in a great measure destroyed before the workmen were aware what they were digging through. Some portions, however, remain uninjured. They are very curious and beautiful, formed of small cubes of blue and white lias and red tile; it is intended to remove and preserve these fragments if possible, but the cement is so decayed that it is feared that the tesselæ will not hold together. Numerous fragments of Roman pottery, and other relics of a domestic nature, have been dug up.—*Bath Herald.*

Antediluvian Remains.—The *Columbus* (American) *Journal* states, that in the prosecution of a geological survey of Jackson county, Ohio, the bones of an animal of extraordinary size were discovered. A tusk measured 10 feet 9 inches in length, and 23 inches in circumference at the largest part, and weighed, when taken from the earth, 180lb. The largest tooth weighed 80lb. 4oz. and the other bones were of corresponding proportions!

REVIEWS OF NEW PUBLICATIONS.

The New Botanist's Guide to the Localities of the Rarer Plants of Great Britain. By Hewett Cottrell Watson. Vol. II. Scotland and adjacent Isles. London: *Longman & Co.* 1837. pp. xxiv., 278. 12mo.

Nearly eighteen months, observes Mr. Watson, have elapsed since the publication of his first volume. The present volume is similar in character to its predecessor, being in fact a continuation and conclusion of the work, the objects of which we may briefly explain. Its aim is to furnish a catalogue of the rarer British plants, either from the author's own observation, from that of such friends as he can trust for accuracy, or from the best published works and catalogues. A separate chapter is dedicated to each county, with the particular locality or localities in which each species has occurred, and occasional notes and observations.

This second volume, as its title imports, treats of the botanical riches of *Scotland;* but in a Supplement various additions are made to the Flora of England and Wales, each plant, as above, being followed by the locality, and the authority on which it is inserted.

So far as we have examined the work it is correctly printed; and, aware as we are of the author's zeal and knowledge of the subject, it is to us no matter of surprise that he has performed his task in the most satisfactory manner.

Having given some account of the object of the work, and an opinion as to its execution, we will conclude with a few words on the preface. It will be in the memory of most of our botanical readers that, simultaneously with the first volume of the *New Botanist's Guide*, appeared Mr. Watson's *Remarks on the Geographical Distribution of British Plants*, a separate work, but obviously intimately related to the former. Mr. W.'s reviewer in *The Athenæum* professed himself at a loss to perceive the *cui bono* of these *Remarks*. Now as a general rule we would not recommend authors to reply to any reviews of their books in periodicals, especially as the reviewer and the public generally care very little about the matter, and as authors are apt to be much more touchy and tender respecting their literary bantlings than an impartial judge would be. In the present case, however, a *principle*, and not the mere feelings of an author, was touched upon, and the discussion is, therefore, not only allowable, but may prove salutary. We can scarcely conceive a more interesting or useful department of Botany than the distribution of plants. The fabrication of systems may be very amusing to their framers, and may prove useful to the student of Botany as an abstract study, but investigations relative to the distribution of plants, properly considered, must lead to results of a more practically beneficial nature to mankind, and to the

discovery of the natural laws which govern the vegetable kingdom. Our author's reply to his reviewer is cleverly managed, and had we not been previously aware of the reviewer's name, we should not have guessed it from Mr. WATSON'S observations. Much less should we have suspected, reasoning *à priori*, that the said reviewer was one of the "pillars of Botany." The erroneous tendency of the reviewer's observations is, however, so obvious, that we shall not waste further time in discussing the point.

Sacred Philosophy of the Seasons; illustrating the Perfections of God in the Phenomena of the Year. By the Rev. HENRY DUNCAN, D.D. Autumn. Edinburgh: *W. Oliphant & Son; Hamilton, Adams, & Co.*, London. 1837. 12mo. pp. 408.

WE have had occasion to review the former parts of this series in preceding numbers (Vol. I., p. 274., Vol. II., p. 225), and the present volume completes the work. It "will be found, in some respects, to differ in its character from the preceding volumes, and to bear, in a large proportion of its contents, a less direct reference to the season of the year. It seemed right that the concluding volume, besides containing various details of autumnal appearances, produce, &c., and of the diversified labours of the harvest, should be mainly occupied with the *general results* of that remarkable system which pervades animated nature, and of which the phenomena of the revolving year constitute one of the most prominent features."—p. iii.

Though original in character and execution, this book is intended for the general reader, and is not altogether free from the errors common to the class of publications to which it belongs. Justice, however, compels us to state, that these are neither numerous nor glaring, and it must further be observed, that it cannot be expected that every one should be fully acquainted with the most recent discoveries in Physiology, Zoology, Botany, and the various subjects which must be occasionally touched upon in these volumes. In cases where these mistakes *are* many and important, the misfortune is, that they will alone remain undetected by those whom they could be calculated to mislead.

The general divisions adopted by the author are,—the phenomena, produce, and labours of the season, the woods, human food, human clothing, architecture, the close of autumn, and general summary of the argument, each chapter containing a vast mass of information, conveyed in a clear and unaffected style.

Though not belonging to that extensive class termed "gloomy religionists"—men, be it observed, better than their fellow-creatures rather in theory than in practice, and often holding views opposed alike to scripture and to reason—Dr. DUNCAN is occasionally, and we think too frequently, inclined to be austere on a

subject than which we cannot conceive one more lofty or more important to our welfare both here and hereafter. Some authors write as if they were addressing a nation of atheists, and are ever endeavoring, by arguments the most tedious and common-place, to convince their benighted readers that there actually exists an Almighty Power. Away with this cant and hypocrisy—for no other terms would so aptly express our meaning—let us have no more of this blind misguided Veneration, which at certain times and in certain minds seems to overcloud even the emanations of men talented and otherwise amiable. We would not be understood to charge this mania upon the Rev. Dr. DUNCAN—but may hint that he verges upon the overbearing and exclusive spirit common, in these matters, to clergy in general, and to divines of the Church of England in particular. We feel no inclination to discuss, either here or elsewhere, the motives which actuate the policy of the established or of any other church, but we shall ever be ready to pass the most unqualified censure on the pseudo-religion of which we have been speaking—especially where introduced into works of science, which it is more calculated to retard than any thing we know.

Having taken this opportunity of expressing our opinion on an important point, we shall conclude by promising the reader considerable amusement and instruction from the series of which the volume before us is the conclusion.

Considerations on the Vital Principle; with a Description of Mr. Crosse's Experiments. By JOHN MURRAY, F.S.A., F.L.S., &c. London: *Effingham Wilson*, Royal Exchange. 1837. pp. 22. 8vo.

THE universal apathy of the periodical press in its notices of Mr. CROSSE's marvellous experiments, and the general inertness of scientific men on so curious a subject, has often surprised us. The comparative silence of the former may be accounted for on the score of inability scientifically to investigate the matter; and the latter class are notoriously slow and unwilling to examine new theories, however important their results might be if true. In order to support these premises, it will only be necessary to mention the names of GALILEO, JENNER, HARVEY, GALL, and a host of others, and to allude to the severe and disgracefully unjust ordeal which the homœopathic system of Medicine is now undergoing. It was, therefore, with feelings of considerable pleasure—alloyed, we must confess, with some *suspicions*—that we hailed the appearance of the pamphlet whose title appears at the head of this article. Had it contained "more reasons and less railing"—fewer charges of atheism, &c.—we should have been better pleased.

As regards Mr. CROSSE's experiments we think it probable, from all we have heard or read on the subject, that the following conclusion at which Mr. MURRAY has arrived is correct, namely, that the ova of the *Acarus* derived from

some of the sources mentioned are hatched by the electricity of the galvanic battery. Every medical man knows, either from his reading or his practice, that minute living creatures have been found in the brain and other parts of the human body, but the cause of their existence in such singular localities is perhaps not so easily explained. No one, however, would think of declaring to the world that these animalcules were created by the instrument of the anatomist. The assumption that Mr. Crosse's experiments *created* living beings is less glaring to the unscientific, but nevertheless it is, in effect, equally a *non sequitur.* These cases, indeed, differ neither in kind nor in degree. Thus, whatever be the popular view of the case, in the eyes of the arithmetician it is equally erroneous to say that 7 & 11 make 17 as to declare that the same numbers are equal to 12.

We believe, with our author, that the vital principle is beyond "human ken," and that it will alone obey the will of Him in whom we "live, and move, and have our being." Many eminent men, however, have taken a different view of this point, and if their researches have led them conscientiously to believe what they advance, their opinions at least demand respect until we have the most positive and undoubted means of refuting them. The authors of the most important discoveries have been accused of impiety, of fatalism, &c. &c., merely for advocating those great truths—those laws of Nature, and therefore of God—which in a few short years afterwards have been freely admitted and taught by every one possessing the smallest claims to the title of a scientific man. New theories, however true, are frequently so entirely opposed to our preconceived opinions, that they appear to us absurd in the extreme, and are at once, without the slightest rational ground for so doing, pronounced to be so, although the wisest among us are too frequently compelled to censure ourselves for hasty and unjust decisions. Let us then beware how we speak disrespectfully of those whose names are considered ornaments of science, and whose works will be cherished and revered by philanthropists as long as knowledge and improvement continue to be desirable. Let us pause ere we designate any one an atheist; and even supposing a man to declare his conscientious belief that there is no one ruling power, we are not to blame him, seeing that he cannot believe what he does not believe.

We have been led to these observations by the strain in which the present pamphlet is written, and the occasional dogmatism of the author upon points in which, after all, he may be mistaken. The aim of his pages is to point out the impossibility of *creating* living creatures, and the probability of the insects produced by Mr. Crosse's experiments having been hatched by the electricity of the galvanic battery. The seeds of plants kept for hundreds and thousands of years have vegetated when sown, and the eggs of insects may, in like manner, have

been concealed in some of the chemical substances employed in Mr. Crosse's researches, and have been hatched by the galvanic influence of the battery. The point can, however, hardly be said to be settled, and we should be glad to receive further observations on a subject so interesting.

Our readers will recognize in Mr. Murray an early contributor to *The Naturalist*.—The pamphlet is dedicated "to George Fife Angas, Esquire."

A Descriptive Account of the Palo-de-Vaca, or Cow-tree of the Caracas. With a Chemical Analysis of the Milk and Bark. By John Murray, F.S.A., F.L.S., &c. London: *Effingham Wilson*, Royal Exchange. 1837. Royal 8vo. pp. 24.

A considerable portion of the matter contained in these pages was communicated by Sir R. K. Porter, the chemical analysis only being by the author. We have been much interested in their perusal; and are alone deterred from giving a summary of their contents by an unwillingness to detract from their circulation. An engraving of this wonderful milk-yielding tree is supplied at the beginning of the pamphlet, which is inscribed, "with great propriety," we are informed, to Sir Robert Ker Porter.—In England we are content to obtain the "staff of life" from Wheat—or even from Rye, Barley, &c.—and milk from Cows, Goats, Asses, &c., but we here learn that a good mess of bread and milk may be procured in the Caracas from the bountiful Palo-de-Vaca, or Cow-tree—*credat Judæus!* But for further and ample particulars we refer our readers to Mr. Murray and Sir. R. Porter.

A History of British Birds. By William Yarrell, F.L.S., Sec. Z.S. Illustrated by a Wood-cut of each Species, and numerous Vignettes. London: *John Van Voorst*, 1, Paternoster Row. Nov. 1837. Part iii.

The illustrations of birds in this third number scarcely satisfy our expectations, though some few almost equal any in preceding parts for spirit and truth. We trust this falling-off is only temporary, and that subsequent publications will not tend to justify the doubtless erroneous suspicion—which has already reached our ears—that so much pains were taken with the wood-cuts in the first part merely to ensure a large sale for the work.

The letter-press maintains the admirable character which we have previously had occasion to commend; and in this department at least we think we have an ample guarantee, in the name and acquirements of the amiable author, that nothing of an inferior nature will be admitted. The work is published in alter-

nate months, and is to be completed in three volumes. We anticipate, with increasing pleasure, the appearance of each successive part, and shall continue, if possible, to report regularly on the progress of the work.

The Phrenological Journal, and Magazine of Moral Science. Vol. XI., No. liv. Published quarterly. New Series, No. i., Dec., 1837. London: *Simpkin, Marshall, & Co.: Maclachan & Stewart*, Edinburgh. pp. 96.

This old friend and favourite of ours, published during a period of fifteen years at Edinburgh—a considerable portion of that time at a heavy loss—is now removed to London, and appears under the auspices of Mr. H. C. Watson, the well-known botanist. The arrangement and spirit of this number is excellent, and augurs extremely well. We only wish the Editor had allowed the old controversy between himself and the former Conductors to rest in oblivion—to say the least it cannot be considered otherwise than bad taste. The work ought to be perused by every philosophic naturalist, who should not be a mere collector of specimens and framer of systems, but ought to feel interested in the *rationale* of Natural History in its most extended sense. Besides the purely phrenological articles there are several notices of immediate interest to the naturalist. We hope ere long to return to this instructive periodical.

LITERARY INTELLIGENCE.

A new edition of Bechstein's *Cage Birds* is just published; but, not having seen it, we can deliver no opinion as to its contents.—The first volume of *British Birds*, by Sir W. Jardine, has lately appeared, forming a part of his *Naturalist's Library*. This work has not yet reached us.—In the press, and speedily will be published, in one 12mo. vol., *The Wonders of Geology*, with numerous engravings. By Gideon Mantell, Esq., L.L.D., F.R.S.—We ought to observe that the second volume of Mr. Watson's *New Botanist's Guide*—reviewed in our current number, p. 53—is a reprint, the whole of the first impression having been destroyed by fire, at the printer's (Mr. Spottiswoode), in the spring of 1837.

THE NATURALIST.

DERIVATIONS OF THE LATIN NAMES OF BRITISH PLANTS.

By Mr. T. B. Hall.

(Continued from page 26.)

Aceras.—From α, without, and κεϱας, a horn, in allusion to the absence of a spur.

Aceras anthropophora, Green-man Orchis, or Twayblade.—It is difficult to cultivate, and can only be propagated by seeds, which thrive best in a mixture of sand, loam, and chalk. The English name is given on account of the supposed resemblance of the flower to a naked human figure, with its hands and legs cut off.

Acinos.—Loudon spells it *Acynos*, and states it to be the Greek name of a balsamic plant, which probably was related to *Thymus.* Withering states that under an erroneous notion that this plant produces no seeds, the ancients applied to it the name ακυνος (*Acynos*), *sine semine, sterilis.*

Acinos vulgaris, Basil Thyme.—This plant has a fragrant aromatic smell, and is rare in Scotland.

Aconitum.—From ακονη, a rock or stone, because it is found in barren or rocky places; or from ακοναω, to sharpen, because it was used in medicines intended to quicken the sight; or from ακων, ακη, a dart, savage nations poisoning their missiles with a preparation from certain species. Theophrastus derives it from Ακονις, a city of Bithynia, near which it is said to abound.

Aconitum napellus, Common Wolfsbane, Monkshood, Helmet-flower, Friar's-cap.—It is not unfrequently met with in rustic gardens, with white, rose-coloured, and variegated flowers; nor can our island longer claim entire exemption from it as a native, notwithstanding Dryden recounts among our blessings, that

> "Our land is from the rage of tigers freed,
> Nor nourishes the lion's angry seed,
> Nor poisonous Aconite is here produced,
> Or grows unknown; or is, when known, refus'd."

That this herb is one of the most powerful of vegetable poisons cannot be doubted. "The force and facultie of Woolfe's-bane is deadly, both to man and all kinds of beasts," says Gerarde, who records several instances of its fatal effects; but it appears that various plants of somewhat similar names have been confounded by ancient writers, and are scarcely to be discriminated by the moderns. The flowers sometimes communicate, in a degree, their noxious quality even by their

odour; and that wearing them on the head may occasion "a violent megrim.' Of the bad qualities of these plants we sometimes avail ourselves to get rid of vermin. The juice is also used to poison flesh, for the destruction of Wolves, Foxes, and other ravenous beasts. It is remarkable that the blue-flowered kinds are much more virulent than those with yellow or white flowers. Physiologists suppose the pernicious effects to be produced by irritating the nervous coats of the stomach and intestines, so as to occasion violent convulsions through the whole body. To relieve the stomach of its contents an infusion of tobacco, followed by oily and mucilaginous medicines, has been recommended. Monks-hood should not be planted where children have access, lest they should put the leaves or flowers in their mouths, or rub them about their eyes; for a serious disorder may be thus occasioned; and the farina of the flowers blown into the eyes will cause dangerous inflammation. Some interesting particulars of the effects of this plant on those who have eaten it are detailed in BAXTER's *Flowering Plants*.

Acorus.—Ακορον, from α, without, and κορη, the pupil of the eye, because it was considered good for disorders of the eyes.

Acorus calamus, Myrtle Flag, Sweet-scented Flag, Sedge or Rush.—The flowers are rare, the dried root powdered is used by the country people in Norfolk, for curing the ague. On the Mayor's day in June, the cathedral of Norwich and some of the streets have from time immemorial been strewed or decorated with this plant, which, when trodden upon, smells somewhat like Myrtle; but having become less plentiful, its place is now supplied by *Iris pseudacorus*, or the larger kinds of Sedge (*Carex*). It is our only native truly aromatic plant. The roots have a strong aromatic smell, and a warm, pungent, bitterish taste, the flavour is greatly improved by drying, and when powdered they have cured agues when the Peruvian bark has failed. They are commonly imported from the Levant, but those of our own growth are fully as good. The Turks candy the root as a prophylactic, and believe it to be a preservative against contagion. Neither Horses, Cows, Goats, Sheep, nor Swine will eat it. The whole plant has been used for tanning leather, and the French *snuff à la violette* is supposed to be scented by this root.

Actæa.—Ακταια, from ακτη, the shore. Shrub-elder, the leaves somewhat resembling those of the Elder. So called because it grows upon rocks and banks near the shore; or from αγω, to break, from its being easily broken.

Actæa spicata, Spiked Bane-berry, Black Bane-berry, Herb Cristopher.—This plant is a powerful repellant. The root is useful in some nervous cases, but must be administered with caution. The berries are very poisonous; their juice, with alum, yields a black dye. Is is said that Toads, allured by the fetid smell of this plant, resort to it; but it grows in such damp and shady situations as

those reptiles otherwise prefer. Sheep and Goats eat it; Cows, Horses, and Swine refuse it.

Actinocarpus.—Named from ακτιν, a ray, and καρπος, a fruit, in consequence of its curiously radiated fruit resembling a Star-fish.

Actinocarpus Damasonium, Star-headed Thrum-wort, or Water Plantain.—This plant had the reputation of removing the effects of the venom of the Sea-dog (LOUDON).

Adiantum.—From α, neg., and διαινω to grow wet. So called because its leaves are not easily made wet.

Adiantum capillus-veneris, True maiden-hair.—A most elegant Fern, especially when it projects from the sides of upright dripping caves or rocks. It is used in the South of France, as well as *A. pedatum,* to make a syrup, which, being perfumed with Orange flowers, is called *capillaire,* and known by that name throughout Europe, as a refreshing beverage when diluted with water. *Asplenium trichomanes* is occasionally substituted—an immaterial imposition, as neither plant seems to possess either pectoral or any other active virtues.

Adonis.—From αδων, pleasing; so named because it was fabled that ADONIS was changed into this flower by VENUS, after having been slain by a Boar.

> "———— Where the blood was shed,
> A flower began to rear its purple head."—OVID.

Adonis autumnalis, Adonis-flower, Red Maithes, Autumnal Pheasants'-eye.—Its beautiful scarlet blossoms have gained it admittance into gardens. Both the French name *Goutte-de-sang,* and the more classical *Adonis,* may equally be traced to the sanguineous colour and globose form of the flowers, especially in an unexpanded state; in the latter designation fabled to have sprung from the blood of that favourite. Besides the English names given above, it has been called Bird's-eye, Red Chamomile, and *Rose-à-rubie, Flos-adonis.* MILLER informs us in his *Gardener's Dictionary* (1759), that great quantities of the flowers of this plant were annually brought to London, and sold in the streets under the name of red-morocco. In French it is called *Gouttes-de-sang* (drops of blood); *Aile-de-faisan* (Pheasant's-wing); and *Oeil-de-perdrix* (Partridge's-eye).

Adoxa.—From α, without, and δοξα, glory; from the humble aspect of this little flower.

Adoxa moschatellina, Tuberous Moschatel.—This is an unobstrusive little plant, flowering as early as the latter end of March, or the beginning of April, and ripening its berries in May, soon after which its leaves decay. It delights to grow in moist shady places in woods and similar situations; a circumstance which has not escaped the notice of the poet—

"Adoxa loves the greenwood shade;
There, wavering through the verdant glade,
Her scented seed she strews."

The flowers have a musky smell in the evening, or early in the morning, while moist with dew; and hence, by some called Musk Crowfoot.

Ægopodium.—From αιξ, αιγος, a Goat, and ποδεων, a little foot: the leaves being cleft sometimes like a Goat's-foot, whence Goat-weed would be a preferable name to Gout-weed.

Ægopodium podagraria.—The root is pungently aromatic, with some acrimony, but it is not at all employed in medicine; nor has it any title to its name Gout-weed, though the Germans formerly used it to assuage the pain both of the gout and piles. LINNÆUS says it is eaten in Sweden, boiled for greens, when tender in the spring. The same author also informs us that Cows, Sheep, and Goats eat it, that Horses are not fond of it, and that Swine refuse it.

Æthusa.—From αιθυσσω, to make warm, as does the pungency of the plant.

Æthusa cynapium, Common Fool's-parsley, Lesser Hemlock.—The whole plant is poisonous, and when eaten is said to cause vomiting, delirium, numbness of the extremities, and often death. We are informed, in Mr. LOUDON'S *Gardener's Magazine*, Vol. II., p. 337, that a boy six years old, who had taken some of the plant for Parsley, at four o'clock, began immediately to utter cries of anguish, complained of cramps in the stomach, assumed a livid hue, and died at midnight. Another child, though the contents of his stomach were ejected, went out of his senses, but by great care ultimately recovered. Two ladies of Castle Donnington, in Leicestershire, partook of a salad into which some Fool's-parsley had been put for Common Parsley; they suffered considerably, but ultimately recovered. We cannot, as Dr. WITHERING observes, be too particular in discriminating these deleterious herbs, especially as they are frequently found growing intermixed with culinary vegetables. This plant has been sometimes mistaken for Common Parsley, but it may be readily distinguished by its leaves, which are of a much darker green, more flat, and more finely divided. It also wants the peculiar smell of the Common Parsley. If the Curled-leaved Parsley only was cultivated in gardens, no such mistakes could happen. Fool's-parsley may be distinguished from Hemlock (*Conium maculatum*) in the stem not being spotted, in its having but little smell, and by its more humble growth. Cows, Horses, Sheep, Goats, and Swine, are said to eat it. It is reported to be poisonous to Geese.

Agrimonia.—From αγρος, a field, and μενω, to inhabit; its usual station being in fields. HOOKER says the name is corrupted from *Argemone*, given by the Greeks to a plant supposed to cure the cataract in the eye, called αργημα; but the former derivation seems to be the most correct.

Agrimonia eupatoria.—Agrimony has been chiefly regarded as a medicinal plant, and as such is often raised in gardens. The leaves have a slightly bitterish, roughish taste, accompanied with an agreeable, though weak, aromatic flavour. The flowers are in smell stronger, and more agreeable, than the leaves, and in taste somewhat weaker. They readily give out their virtues both to water and rectified spirit. The leaves impart to the former a greenish yellow, to the latter a deep green colour. The Canadians are said to use an infusion of the root of Agrimony in burning fevers with great success; and an infusion of six ounces of the crown of the root, in a quart of boiling water, sweetened with honey, and half a pint of it three times a day, Dr. Hill says, is an effectual cure for the jaundice. Infusions of the leaves, which are not disagreeable, may be used as tea. Digested in whey, it affords a useful diet-drink, for the spring season, not ungrateful to the palate or stomach. According to the observations of Linnæus Sheep or Goats eat it; Cows, Horses, and Swine refuse it. The flowers when fresh gathered smell like Apricots.

Agrostemma.—From *αγgος,* a field, and *στεμμα,* a coronet; *quasi* the garland of the fields, the flowers proving a great ornament.

Agrostemma githago, Corn Cockle, Corn Campion, Wild Nigella.—This is a very troublesome weed, and is too common in corn-fields; it should be eradicated by hand before it comes into flower. The seeds are large and heavy, and their black husks, when mixed with Wheat, breaking so fine as to pass the boulters, render the flour specky. They are, therefore, obnoxious to the millers, and depreciate the sample of corn. Gerarde says, "What hurte it doth among corne, the spoyle unto breade, as well in colour, taste, and vnwholesomnes, is better known than desired." It is said sometimes to occur with a white flower. The flowers are generally purple with bluish streaks or upright stalks, and, however odious to the farmer, they must still be considered as very handsome.

Woodside, near Liverpool,
Dec. 22, 1837.

(To be continued.)

ON THE NATURAL HISTORY, SCENERY, &c., OF NEW ZEALAND.

By Thomas Kier Short, Esq.

(Continued from p. 4.)

I left the Mission station, on the second of May, for the Bay of Islands; the first part of the journey is to be performed in boats on the river Whimar, a branch of the Hookeanga. After proceeding up the river for about five miles, I landed

at a native settlement, and then proceeded on foot, which, from the late heavy rains, made it very unpleasant, being something after the American fashion of travelling by mud; the first two miles being knee-deep in their mud and water. The road passed through a large native village, to which were attached large flats of Indian Corn, Kumaras, and Tarra. The Kumara is a species of sweet Potatoe (*Ipomœa batatis*), about six inches long, and one inch thick. Some are red, others yellow and white. It is the sacred food of the New Zealanders at their religious ceremonies or tapus. The Tarra belongs to the natural order *Aroideæ*, but to which of its divisions I could not ascertain, as I never saw one in flower. The natives had also large quantities of Peach-trees.

I now began to ascend a range of lofty hills, the road having been cut on the summit of a high range, through a dense forest: the foliage of the forest was splendid in the extreme. The Palms on the hills were from thirty to forty feet high; some of them were in flower, others in fruit, which was produced in clusters like grapes, and of a crimson colour; they seemed, as Humboldt observes of the Palms of South America, to have a region of their own. The road over which I past had been cut some years previous, but in 1831 a dreadful hurricane visited the island, spreading devastation all around; upsetting houses and huts, overwhelming the noblest ornaments of the forest, which in a great manner blocked up the road. Some of the arborescent species of Ferns were splendid. Nor were the herbaceous Ferns less beautiful, some of which clasped the trunks of trees and stones to such an extent that the ground was literally covered with this tribe of plants.

I observed in this part of the road immense blocks of stone of the same kind as the adjacent hills, which could only have been removed by volcanic agency. After proceeding about four miles through this forest, I arrived at a fine piece of table land, about 1000 acres in extent, and of good rich soil. We travelled four miles over this clear plain, and then entered the second or great forest, which, if possible, is thicker and denser than the first; on the edge of the forest I found *Charleswoodia stricta*, *C. indivisa* and *C. Australis*, growing with the greatest luxuriance, some of them being fourteen feet high.

The path now became very intricate, from the fallen timber, which in many places obstructed the road; the late rain having made it slippery, and my two native guides, being barefoot, were as sure-footed as Chamois, while I with strong shoes had much to do to get on. After ascending the mountains for about ten miles, I came to an opening in the trees, from which one of the finest vistas in the world is to be seen. Far below in the valley the white cottages of the Mission station, imbedded in the most luxuriant hanging woods; whilst the rivers Whimar and Hookeanga wound their course like huge Serpents in the valley, the distant hills covered with verdure, the high bare perpendicular rocks towering above added grandeur to the scene. The scene now changed, the ground being

covered with thick spreading roots and other creeping plants, overgrown with Moss, so as to form a kind of uneven matting which rendered travelling very difficult. The underwood was very thick, and the trunks of the lofty trees rose like clusters of columns supporting a canopy of verdant foliage, through which the sun's rays seldom penetrate. There was no beaten path, and the wide and dreary solitude of the place was only broken by some lonely bird which chirped among the bushes, or, startled by our intrusion on its retirement, darted across our path. This terminated the second forest, the rest of the journey laying through an open country. We now crossed a rapid stream in a deep gully or ravine; on ascending the opposite bank a most beautiful view breaks on the eye of the traveller. A more rich undulating country, or one better adapted for cultivation, is not to be seen. On the right is a fine fresh-water lake of from six to eight miles long, and from four to five miles broad, with beautiful undulating hills, gently sloping to the water's edge, the land of which appeared rich and fertile. Several volcanic hills appeared beyond the lake. The road now turns to the left, through a large savannah, passing three native villages, round the foot of a conical hill, which has all the appearance of the crater of a silent volcano, the ground being covered with scoria. I now arrived at Whimatte, a settlement under the guidance of the Church Mission, it being their farming establishment, under the superintendence of Mr. Davies. They produce fine crops of Wheat, Oats, Indian Corn, Potatoes, Red and White Clover. The establishment does Mr. Davies great credit. They have Sheep, Horses, and Cattle, all of which are sent to the other settlement for the support of the Church Missionaries. I remained during the night at Whimatte, and proceeded to the Bay of Islands next day; on the way I observed four of those volcanic hills previously described, about three miles apart. About four miles from Whimatte we came to the river Kerrekeri; which is to be crossed, and as there is no bridge, it must be forded. From the late rains the river was much swollen, and very rapid; one of my guides said he could carry me over on his shoulders, to which I consented. After proceeding about half-way, my sable bearer, from some unforseen occurrence, stumbled, and away I went, head foremost, into the stream, to the no small amusement of the Tongatamouris.* After picking up my gun and other articles from the bottom of the river, we once more proceeded on our journey. Having ascended a gentle hill, I crossed an elevated undulating plain covered with large masses of scorea and other volcanic substances fast going to decay from exposure to the atmosphere. I also observed that the stream which traversed this plain was much discoloured by oxide of iron, of which there appeared great abundance. Ascending another

* *Tongatamouri* is the native name for a Zealander.

steep hill we crossed a large flat plain, on which I found a species of *Andromeda*, with white flowers, and clusters of crimson berries, a species of *Gravelia*, *Epacris exserta* and *Epacris heteronema;* the ground being covered with a species of *Allium*, which scented the air. On the left, the Kerrekeri wound its course, and now falls over a ledge of perpendicular basaltic rocks, twenty-five feet of a beautiful crescent form, which had a fine appearance.

I have conducted the reader to the summit of the last hill which overlooks the Bay of Islands, and a beautiful view is now before him. It was a still calm evening, the sun just dipping in the Pacific, the bay as smooth as glass, studded with small islands (from which it takes its name); on its bosom lay twenty-seven vessels at anchor, as still as possible, with just sufficient wind to unfold the ensigns of England and America, which last predominates in the proportion of twelve to one. I shall now leave your readers on the beach of the Bay of Islands to contemplate the scene.

Martin Hall, Nottinghamshire,
December 20, 1837.

ON THE GROWTH AND DEVELOPMENT OF HORNS.

By Beverley R. Morris.

Many animals are supplied with horns as instruments of offence and defence, in addition to their claws and teeth, which in animals so provided are generally ill-suited for either of these purposes. In some species the females are not supplied with horns. In others they have horns, though smaller than those of the males; while in others again we find the horns of the female larger but less compact than those of the male. Horns are only found on Herbivorous animals, and although some are without them, as the Horse, yet these are provided with other means of defence, as in the case of the animal alluded to, which has been known to defend himself, and successfully too, against the attacks of even the Lion, by means of his powerful hind legs. These animals also are generally swift of foot, and are thus enabled to escape many dangers. Horns may be divided into four classes. Of two of these little can be said, as they are confined each to a single genus.

They are :—

I. Those which are found on the Rhinoceros. Unlike other horns, they are placed over the bones of the nose, but are not attached to them; having connexion only with the skin. They are true horns, being formed entirely of horny matter, which can be distinctly traced in longitudinal lines, and seem to be a

modification of hair. All other horns are placed in pairs, or one on each side of the median line. One species of Rhinoceros has only one horn, which is placed over the end of the nose, and exactly in the middle line. The other species has two horns, but they are placed one above the other, still retaining their central position. The second or posterior horn is much smaller than the other. They are not deciduous.

II. Those found on the Giraffe. These are horns of the most simple kind, but are not true horns, as no horn enters into their composition; yet from their situation and shape they have received the name, and therefore I shall consider them as such. They are simple bony processes from the *os frontis*, which are at first a little moveable in bony sockets, but soon become fixed and immoveable. They also differ from other horns in being covered with skin, and in having little tufts of hair on their extremities. They are found on both sexes, and are not deciduous.

III. Those which are found on some of the Ruminants, and which are formed on bony processes from the *os frontis*, which are at first moveable, but afterwards become fixed. These bones are covered with a highly vascular membrane, which secretes the horn or hard external cuticle. The horny part grows by lamina which are formed on the inside by the vascular membrane covering the bone. This horn has no vascularity itself, and cannot be made to receive any injection. Those animals whose horns grow most at particular seasons, as the Sheep, have the cuticular or horny matter thrown out most at those times, and as more is secreted than is necessary for its increase in length, it is disposed of in thickening the part last deposited, and thus rings come to be formed which bear a certain relation to the age of the animal. In others, as the Ox, they grow more regularly, and therefore the fibres appear to be longitudinal. The essential distinguishing mark of these horns is their being supported on, and being filled by, bone, and in their not being deciduous.

Many *races* of sheep have horns on both sexes. Others have them only on the males. In the Iceland Sheep they vary in number from four to eight. In the Moufflon, a species of Sheep, the horns are of immense size, the pair sometimes weighing 20 pounds. In the Goat family horns are found on both sexes, but larger in males than females. In the Ibex the horns weigh from three to four pounds each. All the Antelopes have horns of this class, which vary somewhat in form, and in the direction they assume. These horns are also found in all the Ox family. In the Common Ox the horns are larger in the female than in the male, but the texture is less dense and firm. In the Buffalo they are very large, often measuring five feet or more from tip to tip.

IV. Those called antlers, such as are found on the Stag, Deer, &c. These, besides being weapons of defence, are highly ornamental to the animals; they are

found chiefly on the males, though the Rein deer is an exception, both sexes being provided with them. Like the second class, they are not true horns, but consist of very hard bone: its density indeed is nearly as great as ivory. These animals when very young have no antlers; soon, however, a thickening and induration of the skin takes place over two points of the frontal bone, corresponding to the future antlers. These points shortly become adherent to the subjacent bone, and bony matter is deposited in them. At the time for the growth of the antlers, the temporal and carotid arteries, which supply the head with blood, become very much enlarged. The skin over the bony tubercles is absorbed, and a membrane exceedingly vascular is formed, which is in fact a kind of periosteum. This grows in the direction of the future antler, secreting bone from its inside surface; branches are given off, and lastly the palm. The grooves which are seen on antlers are caused by the blood-vessels in the membrane, which, as soon as it has performed its part in secreting the bone, dries up and then peels off. These antlers begin to grow at the early part of winter. They are deciduous yearly, the manner in which they are detached being very curious, and well worthy of notice. It is as follows. After the horns have attained their full size, and the vascular membrane has been removed, the vessels at the lower part—where the tubercles were formerly—still continue secreting, and bone is thrown out; this presses on the arteries which pass through openings in the bony circle at the base of the antler, and at length obliterates them. Absorption of the bone immediately below the bur now goes on, and cuts the antler off. This process is seldom completed, as the horn is generally broken off by the animal striking it against trees, &c. A little blood is effused, but the wound soon heals up. The Elk has immense antlers, with very wide palms, which often weigh fifty or sixty pounds. Antlers are found in both sexes in the Rein-deer, but larger in the male than in the female.

December 18, 1837.

NOTICE OF THE WORKS MOST INTERESTING TO THE STUDENT OF INDIGENOUS PLANTS.

By Edwin Lees, F.L.S., M.E.S.L.

When a neophyte enters upon the study of any science, his first inquiry is for the books that will be of the greatest service to him in the pursuit he has entered upon. Now although *advice* is exceedingly cheap, books unfortunately are not so; and as every student is not a "Prince Maximilian," it becomes

obviously unwise to recommend such works only as are of very high price, however estimable in a scientific point of view. Hence, I fear Mr. SWAINSON'S recommended list of ornithological books in LARDNER'S *Cabinet Cyclopædia*, amounting to about £400, has met with but few respondents. It is, however, important to know what has been accomplished in every science, and as inquiry has been made for botanical works in *The Naturalist* (Vol. II., p. 359), I will proceed to indicate a few of the most curious and remarkable, as well as those absolutely indispensable to the collector of British indigenous plants. This becomes the more necessary, as Mr. LANKESTER, in his mention of botanical books in the December number of this periodical (Vol. II., p. 470), has scarcely done more than given his opinion as to the best elementary treatises on the "Natural System." No doubt Professor LINDLEY is the most learned and able English interpreter of that system, but I can neither agree with him or Mr. LANKESTER that the Linnæan system is "prejudicial to the advancement of the science of Botany." Surely there is something unphilosophical in so summarily and almost petulantly attempting to extinguish a favourite plan of a great master, that still has its advocates, merely, as appears to me, because in some respects it seems to offer greater facilities for tempting votaries to the temple of Flora. Hence I think it but fair to mention DRUMMOND'S *First Steps to Botany*, 12mo., an excellent and interesting botanical primer, and Sir J. E. SMITH'S *Introduction to Botany*, 7th Edit., 8vo., edited by HOOKER, though both these are expounders of the Linnæan system. Dr. LINDLEY, in his *Ladies' Botany*, seems to imply that the natural system requires "a royal road" to soften its asperities, and he has there attempted, after the plan of ROUSSEAU'S celebrated letters, to familiarize the subject, but unfortunately he supposes himself to be addressing mere children. The plates are very superior, however, and if they were made to illustrate a short botanical grammar at a less price than is charged for the *Ladies' Botany*, it would be of universal application. The *Elements of Botany*, by RICHARD, and translated by MACGILLIVRAY, 8vo., is in many respects an excellent work for the student, but almost every Introduction to Botany is too lengthy upon Vegetable Physiology, and contested opinions upon various hypothetical points, upon which a beginner, as he can form of course no decided opinion, ought not to be perplexed about, or have his judgment biassed. I should certainly consider Dr. LINDLEY'S *Introduction* absolutely necessary to every one studying botany *professionally*, and the work in LARDNER'S *Cabinet Cyclopædia*, by the Rev. Professor HENSLOW, is well deserving of perusal and attention. The *Outlines of Botany*, by the late Professor BURNETT, is a magazine of collected research, but its wearisome and excessively spun-out terminology is unindurable. Perhaps the most extensive "Explanation of the terms used in Botany," both in Latin and English, will be found prefixed to GRAY'S *Natural Arrangement of*

British Plants, 2 vols. 8vo., which can now be purchased at less than half its original price in town. There is a work publishing in fasciculi, entitled *Genera Plantarum Floræ Germanicæ*, by NEES AB ESENBECK, which, as it contains plates with minute dissections of the flowers and fructification of every genus indigenous to such an extensive tract of country as Germany, at a moderate price, deserves to be in the hands of every British botanist, and to a student is most valuable. It has, besides, this great advantage, that though arranged on the natural system, only the characters of the genera, with descriptions of the plates, are given, in Latin, and no Linnæan will be displeased by any derogatory remarks, or untoward disputes, for as every genus is referred to its place in the Linnæan system, the work is of course equally useful to every botanist. It may be obtained at BAILLIÈRE's in Regent-street, which it is perhaps necessary to mention, lest there should be "none in town."

I shall now suppose that our inquiring botanist, having mastered his elements, has determined to investigate the indigenous plants of his native country. If he commence with the *Phanerogamia*, or flowering plants, the following works are indispensable:—Sir J. E. SMITH's *English Flora*, 4 vols. 8vo., HOOKER's *British Flora*, 8vo., LINDLEY's *Synopsis of the British Flora*. But all these are without plates, and in doubtful cases a good representation of a plant is something more than a luxury. CURTIS's *Flora Londinensis*, folio, or SOWERBY's *English Botany*, 36 vols. 8vo., should be obtained if the student has £50 or £60 to lay out in books, or if not, at any rate a new edition of SOWERBY is now publishing in numbers at one shilling. There is also a cheap work by BAXTER of Oxford, on *British Flowering Plants*, very good as far as it goes, and enriched with interesting notes. But the plates, it is to be regretted, are very coarsely engraved. There is also a *Supplement to the English Botany*, in 2 vols. 8vo. Numerous local Floras, as they are denominated, have been published, but they are now mostly obsolete, and in fact as their results appear in *Watson's New Botanist's Guide to the localities of the rarer Plants of Britain*, which should be obtained to see what field has been left unoccupied, they may be dispensed with unless picked up accidentally at a book-stall.

The above, however, will not suffice if the Cryptogamic tribes are intended to be studied. In this case the second volume of HOOKER's *British Flora* is requisite, and WITHERING's *Arrangement of British Plants*, 4 vols., contains the most popular account of the *Fungi*. GRAY's *Natural Arrangement*, also before adverted to, contains the *Acotyledones*. On the *Ferns*, and their allies, an admirable little work with plates on a reduced scale of all the British species has recently been published by Mr. FRANCIS, of London, at a very moderate price (See Vol. II., p. 226.). On the *Jungermanniæ*, the work of Sir W. J. HOOKER, in 4to., is the great authority, or there is a cheaper enumeration of the German species, by EKART, with uncoloured plates, entitled *Synopsis Jungermanniarum*.

For the Mosses, TAYLOR and HOOKER'S *Muscologia Britannica*, 8vo., is indispensable, and the intricate tribes of *Algæ* are illustrated in GREVILLE'S *Algæ Britannicæ*, 8vo., DILLWYN'S *British Confervæ*, 4to., and TURNER'S *British Fuci*. These are, however, all expensive books. The Lichens are exceedingly difficult to make out by mere description, and those who pay any attention to this tribe of plants should undoubtedly procure BOHLER'S *Lichenes Britannici*, now publishing in monthly fasciculi, at 3s. 6d. In this work actual specimens are given wherever possible. The varied tribes of *Fungi* have been illustrated in SOWERBY'S *English Fungi*, and GREVILLE'S *Scottish Cryptogamic Flora*. Both must grace the shelves of every extensive botanical library, but their high price excludes them of necessity from general use. A guide to the study of the British Fungi, at a moderate price, is much wanted.

If Arboriculture is the object in view, or curiosity is excited by timber-trees, either natives of or growing in this country, EVELYN'S *Silva*, folio, the same work by HUNTER, 2 vols. 4to., or GILPIN'S *Forest Scenery*, either the original edition or the new one by Sir T. DICK LAUDER, are all full of information and interest on the subject. Mr. STRUTT, in his *Sylva Britannica*, and *Deliciæ Sylvarum*, has given numerous faithful and striking portraits of many aged and remarkable trees, though, to the disgrace of the votaries of a science said to be so very popular, I have understood these works proved a loss to their projector, and can now be obtained at a third of their original cost. It ought perhaps in conclusion to be mentioned, that Mr. LOUDON is publishing an *Arboretum et Fruticetum Britannicum*, containing a vast quantity of information on the culture of trees and shrubs in Britain, with an immense number of plates, but unfortunately three-fourths of the latter are, from a want of character, of no use whatever to a botanist.

There are many works which a man might choose from curiosity to have in a library, which, being of no practical use, are almost so much lumber, such as HILL'S *Vegetable System*, 26 vols. folio, SALMON'S *British Herbal*, 2 vols. folio, and others of the same class; but old GERARDE, often quoted from, and containing many a quaint observation, perhaps deserves to be preserved and examined. There are no doubt many other good works on Botany that might be mentioned, but a multiplicity of authorities can only confound a student, who, once master of his subject, can then judge for himself, and amuse his taste or his fancy according to the seduction that presents itself. If it be intended to bring botanical knowledge to bear upon the broken vegetable relics of a former state of things, the able work of LINDLEY and HUTTON on the *Fossil Flora of Great Britain*, 8vo., with numerous plates, must be consulted. This, indeed, will be a monument of industry and skill when completed.

Dryadville Cottage, near Worcester,
December 11, 1837.

REMARKS ON THE BITTERNS.

By Edward Blyth.

The comprehensive genus *Ardea*, as defined by Temminck, and adopted by Mr. Jenyns in his *Manual of British Vertebrate Animals*, is exceeding difficult to subdivide into minor groups, corresponding to the *genera* of other recent systematists. To confine our attention to the few species admitted into the British Fauna, the distribution of these into Herons, Bitterns, and Nightherons, may appear sufficiently cogent, as the typical forms are mutually very distinct; but numerous exotic species connect these primary modifications of the same type so intricately, that although in the present state of Ornithology their separate recognition is absolutely requisite, it is impracticable to furnish respective definitions that should include all the species, and the only available method of distinguishing them systematically is to indicate the prevalent distinctions of the more characteristic species, the dividing lines—of whatever value we choose to make the subordinate groups—being utterly arbitrary. Indeed, it is hardly necessary to seek beyond the British (or, more properly speaking, *British-killed)* species, for exemplification of the futility of attempting dichotomous separation. The Purple Heron, though otherwise a typical *Ardea*, has the toes and long claws of a Bittern; as has also the Buff-backed Heron or Egret (*Ardea-egretta russata)*, the short and comparatively weak bill of which, I have little doubt, will sooner or later induce somebody to make a separate division of it. Bojé has already indicated *A. ralloides*, Auct., and some allied species, under the designation *Buphus*, and the Prince of Musignano has distinguished the tiny Dwarf-bitterns by the term *Ardeola;* the former having been variously posited, by different writers, as Herons or Bitterns; and the latter, also, grouped with the Bitterns by Mr. Selby, whereas Mr. Jenyns deems them to be more immediately related to the true *Ardeæ*. Again, the Cayenne Nightheron (Yellow-crowned Heron of Wilson) deviates considerably from the type of *Nycticorax*, approximating the Boatbills (*Cancroma*); which latter are physiologically as closely allied to the rest of the group as are either of the previously specified divisions. Save the American and European Bitterns, therefore, and the greater and smaller European white Egrets, not two of the various species which have occurred in Britain are subgenerically altogether identical. Still it is only when a numerous suite of foreign species are placed in juxta-position, that the nullity of what many consider to be satisfactory separations becomes palpably apparent.

On the other hand, however, the entire group (comprising the Boatbills, of which the beak, as stated by Cuvier, is simply that of a Heron or Bittern, very much flattened and inflated) is as thoroughly distinct from all other groups, even the most allied—which is that of the Storks and Adjutants—as can well be;

there is no indication even of a passage into other forms; and the essential characters of the common Grey Heron of this country will apply to the whole series. The immediately superior group comprises four such distinct, though nearly allied, types, which, according to my notions, should constitute as many separate families: of these the Heron, Stork, Spoonbill, and Ibis genera are respectively typical; and each is distinguishable by anatomical, equally with external, characters. I am far from being satisfied that the Courlan (*Aramus*) appertains to the same major division; and deem it the wisest plan to refrain from making any remarks on this singular bird till I know something of its rudimental anatomy.

The whole of the above minor groups, together, compose the *Ardeidæ* of the Quinary systematists, and the *Grallatores Robustirostres* of an arrangement which I am preparing for publication. They are distinguished from all other *Grallatores* by coming into the world helpless and blind, requiring to have food placed in their mouths. Of moping sedentary habits, they commonly remain a long while fixed in the same position: and feed exclusively, or very nearly so, on animal matter, chiefly on small-sized *Vertebrata*, though, in short, on whatever moves that is not too large for being swallowed. The majority perch, and even nestle on lofty trees, frequently several species together, in numerous societies; and, excepting the Spoonbills, I believe they all lay spotless eggs, of which the yolk is disproportionately small, and the shell thin. The period of incubation is comparatively brief, which accords with the helpless condition in which the young are excluded. A large proportion of them do not attain maturity until they are two years old; continuing solitarily dispersed in marshy districts during the first season of propagation. The common British Heron may again be selected as the general standard of the entire division.

But it is with the first of the four minor groups that we are now more particularly concerned; and I shall henceforward speak of it under the term *Ardeidæ*, from which it will be understood that the Storks, Spoonbills, and Ibises, with their subordinate genera, are excluded. All four possess a large and membranous stomach, and very wide gullet; intestines narrow, and of considerable length; the Spoonbills have no cæca; the Storks and Ibises two cæcal appendages of small size, most developed in the latter; and the *Ardeidæ*, in every instance, a single minute cæcum. The last-named have also the ordinary pair of sterno-tracheal muscles to the inferior larynx; of which the Spoonbills, Storks, and I suspect the Ibises, are devoid, whence these birds are necessarily destitute of voice, which is the more extraordinary in the instance of the European Spoonbill, the trachea of which species undergoes a peculiar convolution. In the *Ardeidæ*, the inner edge of the middle claw is constantly pectinated; no trace of this structure occurs among the Storks and Spoonbills, and only a slight indica-

tion of it in certain Ibises. All have an amazing spread of wing in proportion to the weight of their bodies; but the skeleton is extremely light and frail, more especially in the three, or in the ultimatum degree in the two, first divisions. The sternum is short, and singly emarginated behind; and the furcula is attached to the anterior portion of its ridge or keel. The Ibises, however, and to a less extent the Spoonbills, form exceptions to this, in so far as the breast-bone is doubly emarginated at its posterior edge, and the Ibises otherwise approximate in their conformation to the Curlews and others of that group, with which Cuvier associated them, having been induced to do so, probably, from the near resemblance which is observable in the skeleton; still we require only to know the digestive organs, and mode of propagation, of the Ibis group, to assign immediately its true position in the system. The character of its plumage, again, at once indicates its affinity to the Stork rather than to the Curlew: and to mention still another distinction, it may be observed, that all the species brought together under my term *Robustirostres* have the hind claw produced, and articulated on an even plane with those in front, whereas the *Scolopacidæ* on the one hand, and the *Gruidæ* (or Cranes) on theother, have the hind-claw elevated upon the tarsus. Moreover, the weight of a Curlew is very nearly double that of an Ibis of the same dimensions: even their attitude, and carriage, sufficiently indicate the very distinct divisions to which they respectively appertain. A peculiar and constant character of the *Ardeidæ* (as here limited) is the tuft of unelastic cottony down upon the breast, and again to the interior of the thigh. This causes a singular glandular structure which secretes a powdery matter resistive of moisture, much of which (powder) is retained, as in a powder-ball, by the down specified. After handling and rubbing the fingers in this down, they may be dipped into water without being wetted. The powdery substance is distributed over the plumage by merely shaking it, and of course tends to keep that portion of it dry which would otherwise be almost in a soaking condition. The site of its production, moreover, is so ordained as to protect the muscle of the breast from being chilled by contact with water; for a Heron will often strike a fish at so great a distance, that the body inclining forward upon the pivot of the legs, dips the breast when the bird has stood, as it often does, in water reaching to the commencement of the bare part of its tibiæ; the impervious down thus appearing as a very beautiful provision of Nature. I was led by actual observation to appreciate this use of it, but still am by no means satisfied that I yet comprehend the final purport of this peculiar structure, for the Bitterns, which are not habitually piscivorous, possess it equally with the most piscivorous Herons.

All the members of this family seize, and in many instances transfix, their prey by an instantaneous stroke, which the great length of the neck enables

them to do at an unexpected distance. Sir W. Jardine thus popularly describes the mechanism by which this is effected. He is speaking of the genus *Plotus* (or Darter), the members of which, he states, "among the *Pelecanidæ*, exhibit the extreme structure in the power of darting and suddenly again withdrawing the head. The Cormorants and Herons possess this power to a great extent; and they all possess a peculiar bend of the neck, observed in certain circumstances of the bird's economy, and into which that part at once puts itself when the bird is dead. This is produced chiefly by the action of two muscles; the one inserted within the cavity of the breast, and running up with a long tendon to the vertebra beneath the bend, the other inserted in the joint above the bend, and running far down with another slender tendon. The action of these two powers, united by the muscles of the back part, produces the peculiar angular bend, and enables the head to be thrown forward with great force. The effect may be easily seen, and produced, by a jointed stick having cords affixed, and acted on in this way."

The Camel, and some other Mammalians, lower the neck to browse, and then suddenly *raise it again, by an analogous mechanism.* The duplicature of the neck of the Heron should be a great deal more studied than it is by those who undertake to preserve specimens of this tribe of birds. The lowermost portion of it is directed downward over the breast, and is devoid of plumage; so that the lengthened feathers of the fore-neck, which, while at ease, the bird frequently allows to droop, when drawn up close appear to be continuous with those of the breast: the bare hind-part of the neck, also, doubles back upon itself, the plumage of the fore-part closing over and quite concealing the duplicature in the majority of species: and lastly, the long and spear-shaped bill, with the head, completes the figure of an *S*, and in the Spoonbills, Storks, and Ibises, the beak is ordinarily rested on the fore-neck, in the Storks very commonly pointing perpendicularly downward. The trachea, in one part of its course, proceeds along the back of the neck. Stuffers most frequently err in not making the lower extremity of the neck bend downward, so much as it ought to do, close over the breast.

White, of Selborne, and other writers, who assert that these birds retract the neck, when flying, and extend the legs, for the purpose of counteracting the forward tendency of the body, should have remembered that the muscles of the neck attain their equilibrium when in this position, which, consequently, is simply that of rest. When a Heron or Bittern rises, I have noticed that this is ordinarily done in a sluggish manner, with the neck often extended, as the bird surveys the tract of ground over which he passes, and the legs drooping; forcibly recalling to mind the unwilling flight of a Rail or Gallinule; after a while, however, if nothing tempts him to alight, he contracts the neck, and, stretching

out his legs backwards, appears to assume that attitude which is certainly more convenient for soaring, and which he still retains when he has gained the wished-for altitude. The Crane family always fly with the neck extended; and perhaps the loud cries of these birds, the vocal organs of which are similar to those of the wild British Swans, require that the neck should be straightened in order to give them their full intonation. Among the Crane family I do not include the Agami *(Psophia)*, which pertains to altogether a different division, being allied to the Tinamus.

It has been said that the Bittern, when it emits its astounding note as it ascends circling, always stretches out its neck, which is not unlikely. The booming of this bird is a greater mystery than has been considered; for there is nothing in the conformation of its vocal organs at all differing from what occurs in the rest of the *Ardeidæ*. According to Dr. Richardson, the notes of the American and European species are precisely similar. Most of the Heron family have a single unvaried cry, which in the Common Heron may be likened to the sound *quank*.

The general exterior, habits, and deportment of the Grey Heron of Britain are popularly too well known to require much description; and it might be supposed, as quite a matter of course, that its progressive stages from youth to maturity would be accurately described by every author who has written on British birds. So far, however, from this being the case, I am unaware of a single writer who has distinguished its three separate states of plumage, which are common to the two sexes. The perfectly adult garb of each is detailed by Montagu as that of the male; and their second plumage more briefly as that of the female; but when he additionally states that the young males resemble for some time the latter, it is clear that he had never actually compared them, but wrote at random, which was by no means a common practice with that acute observer. The young of the year, besides certain terminal pale spots on the wings, which are lost at the first moulting, have all the back plumage rounded, not exhibiting even a tendency to assume the acuminate form observable in the adults; and in their second plumage the dorsal feathers are considerably less elongated than in their subsequent attire. Montagu expresses surprise, moreover, at the great distance from any heronry at which these birds occur during the season of propagation; not being aware that the young of the preceding year continue solitarily dispersed until they attain the fully adult livery, in which only they are known to breed. I question whether any of the large *Ardeidæ* propagate before they are two years old; unless the Bitterns do so, which is very probable, as I know from observation that these acquire their adult dress during the first autumn.

The typical Bitterns may be stated to retain permanently that character of

plumage which is lost at an early age in the genera allied to them. This may be exemplified by comparing the adult American Bittern with an immature Dwarf-bittern (subgenus *Ardeola*); whereupon it will be seen that the rudimental markings of the two species correspond feather by feather, which markings are temporary only, and characteristic of immaturity in the one, and permanent in the other. I have reason to believe that the male Dwarf-bitterns usually acquire the perfectly adult dress at the first moulting, and the females not till the second; that the latter breed in their second or intermediate garb, I can state positively, from dissection; and I also know that the older females are undistinguishable from the males.

As a group, the true Bitterns have the legs and neck shorter than in the Herons: the toes and claws long, the latter but slightly curved; beak less robust, and laterally very much compressed; the ridge of the upper mandible having a slightly curving outline. Neck densely clothed in front with long and lax feathers; and the body-plumage also erectible and long, with the webs connected. The entire plumage is minutely mottled and blotched over with specks and broken bars, of black and different shades of brown, assimilating in hue to their locality. The sexes scarcely differ, and the young are chiefly distinguishable by their comparative inferiority of brightness. They are very nocturnal birds (at least it would seem so) when in their wild state, and inactive during the glare of day; are solitary in habit; and while at rest, in their lonesome sedgy retreats, assume a contracted posture, with one leg commonly drawn up, the neck quite hidden, and line of the head even with that of the back. The same attitude is maintained when walking, which is effected stealthily with long strides; the neck is always held in readiness to be darted forth on any live object of size not too large for being swallowed; our native species will readily gorge a Rat, or a Water Rail. They do not habitually subsist on fish, but on amphibious, and small warm-blooded animals; and appear rather to steal unobserved upon their prey, than to wait for it, in the manner of the Herons. I have seen one gradually let down its foot, and noiselessly advance upon its prey, with most patience-tiring slowness; as indeed may be commonly observed of the whole group; and a very beautiful provision of structure exists with intent to enable them to move with such excessive slowness. They inhabit secluded wooded marshes, where they nestle on the ground, being never seen to alight on trees; and during the breeding season emit discordant bellowing sounds, of astounding loudness; these *boomings*, as they are popularly termed, being mostly uttered at intervals during the evening and morning twilight, and both on the ground and as they spirally ascend to a vast height; their feeding grounds, I suspect, being commonly at some distance from their diurnal abode, in desolate mountain morasses, where scarcely another living creature is to be found.

At sight, or perhaps hearing, of an enemy, they either run off with considerable speed, threading the interstices of the reeds, and insinuating themselves with ease through extremely narrow passages, which renders them difficult to flush; and, if at length they rise, fly heavily to only a short distance, with neck extended, and legs drooping; reminding one forcibly of the *Rallidæ* (though sometimes they will soar spirally till lost to the view); or they lie close, instinctively trusting to the resemblance of their tints to that of the surface, and, if discovered, boldly await the attack, crouching and puffing their whole plumage, and opening the wings, so as to present a complete ball of feathers to their adversary; the neck being at the same time retracted, and head held very low, with the beak pointing upwards, and the smooth feathers of the crown appearing (as usual) continuous with the back plumage, which latter is raised high. This has erroneously been represented as their common attitude of rest.* Upon attack, they dart the bill upward, *invariably* aiming at the eye of their assailant; and have many times been known to blind a Dog with this powerful and sharp-pointed weapon; when they run, it is to seek a place of concealment; and our native species has been known to turn and stand at bay with a Water Spaniel. Indeed few Dogs will renew the contest with it after receiving one or two thrusts of its bill. Several oil paintings (no doubt commemorative of the witnessed fact) represent this bird, and also the Heron, as having transfixed the Falcon in its impetuous descent; and from what I have seen of the Bittern's upward thrust, when on the ground, I have no doubt whatever that this is its constant endeavour when pursued by a Falcon; for which reason the latter, most generally, strikes at the pinion of its quarry, which, I am fully aware, when gradually descending wounded, makes no further attempt at defence till it reaches the ground. The pursuit of the Bittern was eagerly followed in days of yore, not only on account of the elegant manner in which it endeavoured to soar spirally above its enemy, but for the excellency of its flesh, which is still held in estimation; as is also that of the transatlantic species by the Anglo-Americans. I can myself bear testimony to its goodness, and freedom from any kind whatever of unpleasant flavour.

From their size and sluggish flight, when forced to take wing, these birds present an easy mark to the gunner; and a small charge of shot suffices to bring one down, on account of the extreme slightness of its frame, common, as before stated, to all the *Ardeidæ*; though at the same time they are very tenacious of life. If only slightly disabled, however, it quickly throws itself on its back, and defends itself so desperately with both beak and claws, as to require considerable caution in the handling; it never attempts to strike with the former dangerous

* Vide *Règne Animal.*

weapon except at the eye; and I have noticed that the bill is opened while making the stroke, the bird snapping at, rather than endeavouring to pierce, the eye of its adversary. I have known two instances of birds of this species, which I believe could very easily have been taken alive, occurring within a few miles of the metropolis, when the ground was deeply covered with snow; at which time they appeared stupified, or were perhaps dazzled, and on being roused only flew a few yards and then settled on a slight eminence, and immediately crouched, puffing their plumage as has been described. Both were shot at, which I conceive to have been quite unnecessary for the purpose of capture.

The general opinion is, that the Bittern is of much more rare occurrence in Britain, at the present time, than is actually the case; although the great majority of those which are now found may be stragglers from the Continent. Plenty of them are brought every winter to the London markets, where a few days ago a fine specimen was offered to me for three shillings and sixpence, and I doubt not that I could have obtained it at a less price. Moreover, these specimens are exposed at the stalls of poulterers who do not derive their supplies from the Continent, as is done on a very large scale by several of the market people.

Buffon and subsequent compilers have described the European Bittern as an untameable species; the fallacy of which will soon appear on a visit to St. James's Park. The Ornithological Society had originally, I believe, four Bitterns, of which only two are now living. One of them was struck with a stick by a mischievous boy, while feeding with familiarity on what the visitors threw to it, and died instantly, from the effect of the blow; the remaining two have not, that I am aware of, hitherto ventured off the island; but I have there seen them come forth from different parts of the thicket of shrubs at the "*coop, coop*," of their feeder, and after looking a little to the right and left, with neck upraised, to see that all was right, walk boldly forward and take small fishes from his hand. I recommended that poultry-entrails should be given them instead of fish, and they have since evinced a decided preference for the former diet. My friend Mr. Bartlett kept four of the little Dwarf-bitterns for a considerable time, and these also would leave fish to feed on poulterer's refuse. One of this species, having purposely been kept without food for a few hours, swallowed in succession seven good-sized Sprats at one meal.

It is remarkable that the Bitterns in St. James's Park never enter the water, or watch for fish, much less swim across, which the Purple Herons do occasionally; they would seem to be more diurnal than in a state of nature; and at night regularly go to roost, *climbing up* to the tops of bushes for this purpose. When roosting they assume the defensive attitude if approached, pointing the beak upward; but the tameness of these birds prevents this remarkable habit being noticed in them to the extent which I have witnessed in the wild birds. The

little Dwarf-bitterns assume the same posture on similar occasions, as noticed by Colonel MONTAGU, and copied from him by Mr. SELBY; but both these naturalists have fallen into the prevalent error of supposing that this was the attitude of rest. All the actions of the Dwarf-bittern are precisely those of the other, and it runs with the celerity of a Rail. It *uses the bill* to assist it in clambering —a fact which I have also noticed in the Corn Crake; and I doubt which of either of these two species could insinuate itself through the narrower crevice. I suspect that the Dwarf-bittern is commoner in Britain than is generally supposed, for it is a species extremely liable to escape observation. The few that have been shot have mostly been observed when perched on Willows, on which occasion, at sight of an object of distrust, it will extend horizontally its long neck to the utmost stretch, and in an instant, if your attention be momentarily diverted, retract it suddenly; but it will readily allow of being approached within gunshot, appearing to rely instinctively on its inconspicuousness. The American Dwarf-bittern has been shot from a heronry upon lofty trees, where several different species bred in society; but both the American and European species would appear most commonly to nidificate on the ground, like the typical Bitterns.

M. BAILLON states, of the large European Bittern, that "during the months of February and March, the males utter, in the morning and evening, a cry which may be compared to the explosion of a large musket. The females run to the sound, sometimes a dozen round one male, the male Bitterns strutting among their mates, and endeavouring to drive off their rivals." This has often been quoted, and the opinion consequently advanced, that the birds of this genus are polygamous. I conceive that M. BAILLON must have witnessed a congregating of these birds for the purpose of pairing, such as AUDUBON describes of the *Ardea herodias*, and such as many observers have had occasion to notice in Magpies, and a variety of other species. The European Bittern is no where sufficiently plentiful, in one place, during the season of propagation, nor is there that difference in the proportionate size of the sexes, observable in the Ruffs and other known polygamous birds, to induce the supposition that it is otherwise than monogamous, like the rest of the *Ardeidæ*. It is a species which, from time to time, I have had tolerable opportunities of becoming acquainted with, as I trust the above remarks on it will sufficiently indicate. Next spring, it is probable that the London ornithologists will enjoy a few samples of its music, should the Ornithological Society succeed in keeping these interesting live specimens through the cold weather.

North Brixton, Surrey,
Dec. 8, 1837.

HINTS TO YOUNG ENTOMOLOGISTS ON CATCHING, KEEPING, AND BREEDING INSECTS.

By James Charles Dale, Esq., A.M., F.L.S.

Some time ago you requested me to give you, for *The Naturalist*, a few hints as to the apparatus used by entomologists, and as some of your friends may be inclined to climb the mountains or explore the lake country during the next season, I send the following extracts, &c., for that purpose, and hope your correspondents will give me a fine list of rare captures in return.

The entomologist should first consult Dr. Letsom's *Naturalist's and Traveller's Companion*, Donovan's *Instructions*, Harris's *Aurelian* and other works, Graves's *Naturalist's Pocket-Book*, Kirby and Spence, Miss Jermyn's *Vade Mecum*, Curtis's *Instructions*, Samouelle's *General Directions* and *Useful Compendium*, &c. I have Ingpen's *Instructions* interleaved, and a few blank leaves at each end for a list of rare insects, with the dates, localities, &c., as a pocket companion.

The first thing is the *dress*.—A plain sportsman's fustian jacket, with numerous pockets, not omitting the side or breast pocket for forceps or little bag-net, which is made of a single wire-hoop bent into a circle, and the ends formed into a handle, and which I think preferable to the forceps, especially for taking insects in a gravel-pit, where I lost with the forceps the first *Chrysis succincta* I ever saw, from a stone getting between the rings of the forceps. Mr. Tuther formerly told me of a light-green coat with fifteen pockets for nets, &c., but a large fustian-bag for your nets, umbrella, &c., and an angler's basket for your boxes, vasculum (for sandwiches), and whiskey-flask (no bad accompaniment on the mountains); Jarvis's *India Rubber Polish*, for thick shoes, to make them waterproof, or *anti-attrition*; a horn for drinking, or smoking insects; a tin case of Cocoa-powder or paste for breakfast; knee-caps for moss hunting, or a little bit of board with a cushion to kneel on in damp places. If you intend to ride on horseback any distance, it would be well to send your *heavy* luggage with the large corked box or setting-boards, cages, &c., by coach, to the inn nearest the locality you mean to collect, to await your arrival. You may then mount your horse, equipped with your *lighter* apparatus, such as you may be in want of before your arrival at the inn. Put your long nets, sticks, &c., into a long canvass-bag or a tin box like a quiver for arrows, with lock and key and rings, through which you may sling it on your back like a gun.

All the travelling store-boxes, cages, nets, &c., should be made as portable as possible, and so as to fit each other in packing into the smallest compass, and it would be well if *one* screw or spring clasp fitted *all* the net sticks.

1. The *Clap-net*, Bat-fowling net, or Batfolder, may be had at the fishing-tackle shops (where called Butterfly traps), may be made of Musqueto gauze, and one of the rods used as a walking-stick. *White for day and green at night.*

2. *Forceps*, a pair of toupee irons or curling tongs, will do very well, with a net or rackett fixed at the end of each tong with binding wire or small twine well-waxed. The Germans use a much larger and longer pair of forceps, having leaves of ten or twelve inches in diameter, for taking *Lepidoptera* settled.

In one edition of *Peter Pindar*, Sir Joseph Banks is represented as hunting the "Emperor of Morocco" with a net like this.

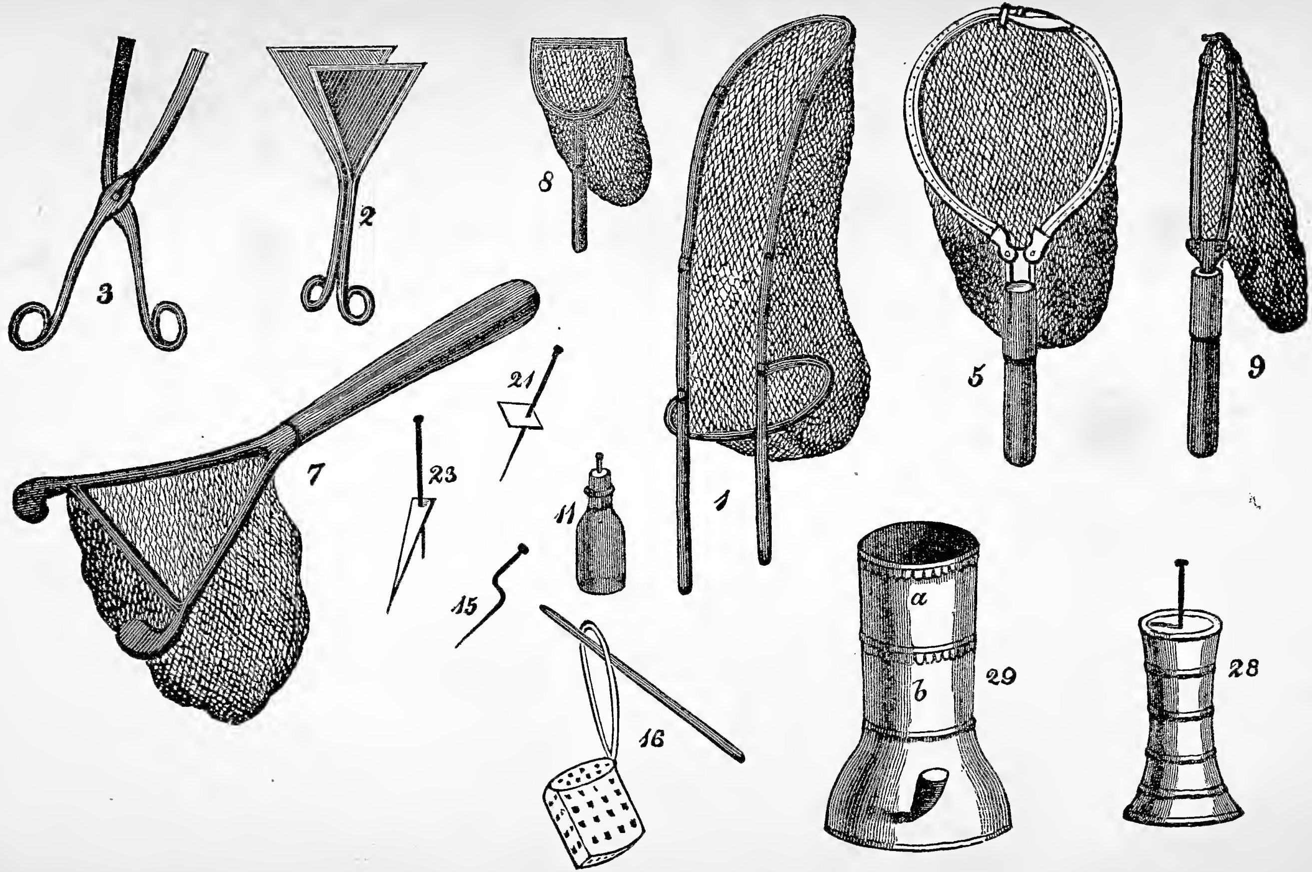
3. *Tongs* (called Crane-necked at the Surgeon's Instrument-makers) or Forceps, for securing insects armed with stings, and for dipping and killing large Moths, &c. (with the wings up), in boiling water.

Miss Jermyn recommends a "Casting-Net," viz. tie a weight (a halfpenny for instance) in one of the corners of a piece of gauze (size of a handkerchief), a lighter weight in the second corner, and a bit of light wood in the third; fix a piece of twine a yard or two long at the remaining corner. It may be thrown and drawn in at pleasure. Harris recommends a large sheet and long pole for larvæ.

4. *A Ring or Racket Net* is formed of wire about the size of a Raven's quill, turned round to a circle, bending the ends outwards by way of shanks, which are made fast in a brass socket; this ring is covered with gauze and bound round with ferret; a round stick of two feet in length serves as a handle. A pair of these, six inches diameter, is very useful.

5. *A Hoop, Sweeping, Water or Landing-Net.*—I procured one from Chapman, York, made of iron-hoop, the net made of white canvass, and fastened with wire to the middle of the hoop, the sharp edge admirably adapted for cutting through Thistles, Nettles, &c., in brushing herbage, and thereby not injuring the canvass as when fastened round by a welt. If a hinge be made it may be folded up, and the handle may be made like a parasol-handle. If a welt is used for the water-net, the *inside* should be *painted* and made very stout, to prevent rust, and with a moveable tin tube, or it may be made to screw on at the end of an umbrella.

6. *Ettingsall's Dublin Landing-Nut*, used by anglers, is made of Whale-bone, and net fastened with wire or waxed string to the middle of the Whale-bone like the last net, the sharp edge not wearing the net by coming in contact with weeds, Brambles, &c. There should be two nets, one for sweeping, made of white canvass, and the other of gauze for flying insects.—The Whale-bone part when shut up is very portable, and one stick may be used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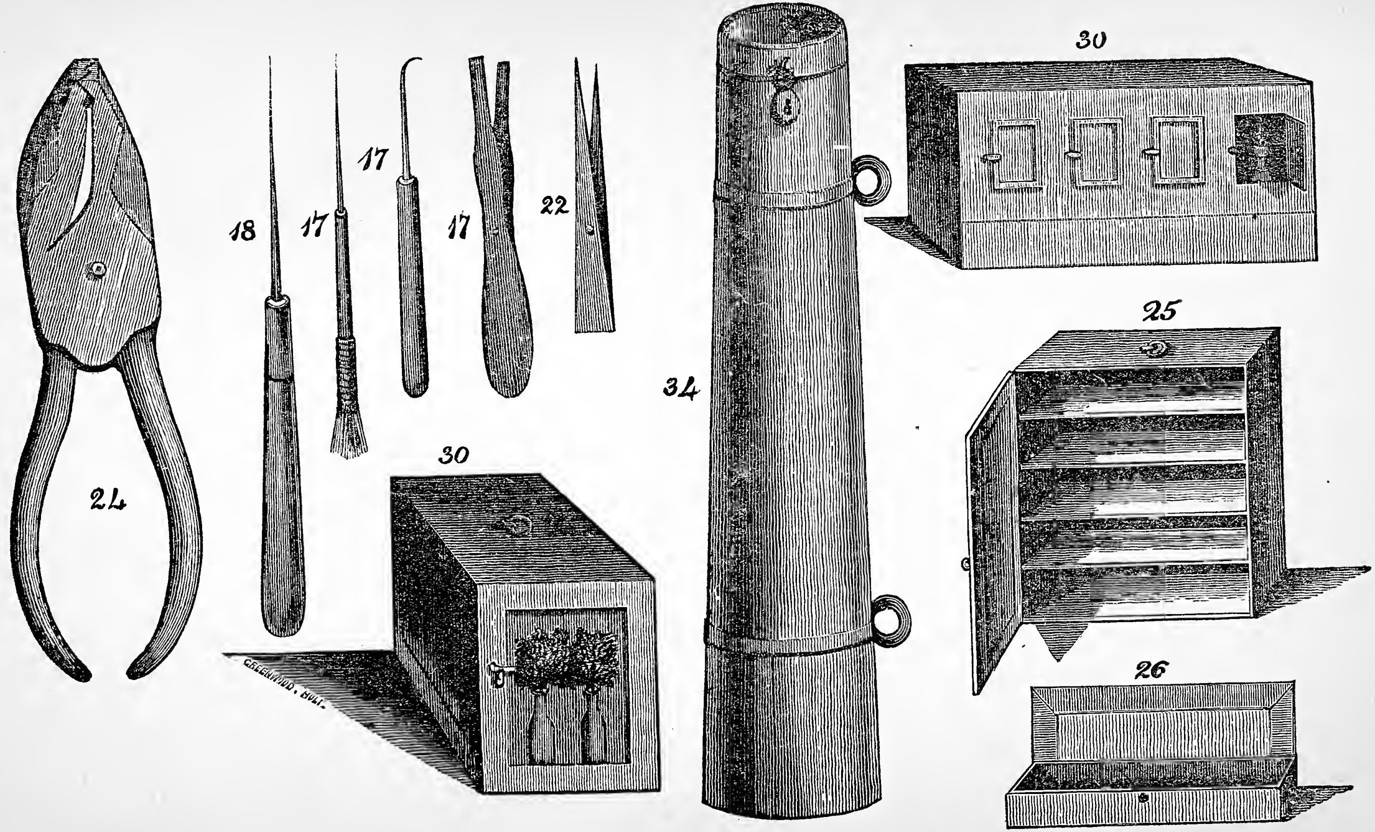
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for walking; the second may be jointed, either by screw like a parasol, and carried in the pocket, or single, and may be carried in the sling-bag or quiver. At the end is a small spear to screw in, to fix in the ground, or it may be used in defence against a furious bull or Dog, which not unfrequently interrupt the sport.

7. MACLEAN'S *Elastic, or* WOOLEY'S *Spring Net.*—Is constructed of two pieces of steel or split cane, connected by a joint at each end, and with a rod which lies between them, in which a pully is fixed; through this a cord (or Cat-gut), fastened to the canes (or springs), passes; a long cane with a ferule receives the lower end of the rod, and forms a handle; and to the canes is fastened a net of green (or white) gauze. Taking the handle in your right hand and the string in your left; when you pull the latter the canes bend till they form a hoop, and the net appended to them is open; when your prey is in it, relax the cord and the canes become straight, and shut the mouth of the net, keeping these close with your left hand, take the insect with the right.

8. PAUL'S *Turnip-fly-Net* (of Starton, Norfolk).—For sweeping the grass, &c., and which Mr. PAUL employed to clear his Turnips of *Haltica nemorum*, &c. The wider it is the greater space it will brush at once. I have used it, but it does not meet my approbation, or perhaps in a level light soil it may answer the purpose better than here—an uneven, hard, clay soil.

9. *Bag Net.*—The French collectors use a net in which the hoop is formed of two semi-circular pieces of iron or brass wire, hooked together at one end, and at the other made to lap over the corresponding piece, and pierced to receive the screw at one end of your stick. When not employed, they double the hoop and conceal it under the vest; and when using it, a certain twist completely closes the mouth, so as to prevent the captive's escape.

10. *A Digger.*—A small trowel, dung-fork, and small garden-rake, are useful on sandhills and sea-shores, where the late Captain BLOMER found the larvæ of *Actebia præcox*, *Agrotis valligera*, &c., among *Galium* or Bedstraw. A strong clasp-knife, with a saw-blade, &c., will be useful.

11. *A Phial*, or tin bottle, in which a tube should be introduced and extended a little way down the bottle, to prevent the insect's escape; a quill passed through the cork, with a cork or wood stopper, will be useful for small insects. If spirits-of-wine be put into the bottle, only *dark* Beetles should be put into them.

12. *Quills.*—Either Swan or Goose quills, with a cork or wood stopper, will be useful for minute insects; a little camphor in them, and should be shaken each time, if another insect be put in. Several of these quills will be

required, and when filled may be put into the turpentine-box with those pill-boxes which contain any not likely to injure themselves by fluttering, such as *Tineæ*, which must be put into the other tin-box to keep cool till your return home, when they may be killed by the fumes of sulphur. A number of small phials with their rims ground down, and well corked, and a piece of hollow Elder, with a plug, and the ends of the quills, should be secured with waxed silk.

13. *Pill-boxes.*—As they are liable to be crushed and the covers to come off, three or four dozen of different sizes should be papered round the edges with a thin paper, and inside if the covers do not fit well. Holes should be pierced through them from the inside, to allow the fumes of sulphur without opening the lid, at the risk of losing the insect. The boxes should be numbered, and if a few were made of tin they would not be crushed. They may be carried in the hat, with a handkerchief over them, to prevent their rolling about. But the best way is to put those intended for sulphur into—

14. *The Tin Box* (an old gun-powder cannister with a lid) till you get home, and the tin box with a double lid, and a strainer near one end, with a sponge or coarse woollen cloth for spirit-of-turpentine or ammonia (Mr. Deck's plan), which answers well for small *Hymenoptera*, &c., and will even kill *Libellulæ* and *Locustæ*.

15. *Pins.*—The Swedish and Russian pins are the best made, the heads are very firm and round, but they are too long and slender. The heads of the small English pins are very liable to come off (and then the insect runs great risk of being spoiled). These may be secured by heating their heads in the flame of a candle, and dipping them in sealing-wax (lead colour, or as near that colour as possible). Silver pins should be used for those most liable to grease. The makers are Durnford, 36, Gracechurch-Street, and Hales, 15, Great-Dover-Street, Southwark.

16. *Pin-cushion*, should be suspended round the neck, and put under the waistcoat; only moderate sizes should be taken out, *Tortrix* and *Tineæ* will do at home.

17. *Pliers*, *Tweezers*, *Setting Needles*, *Needles and Thread*, *Scissors* and *Camel's-hair pencils*, should be carried in (18) a *Leather Case* like a surgeon's, and a little (19) *Gum-water*, or in a wooden ink-horn made secure to prevent the gum-water from leaking, or like what the Excise-men use, with a glass tube down the middle.

20. A little isinglass mixed with the gum or Priest's Diamond Cement, and (21) some fine *Card paper* cut into small square pieces, will be useful.

22. The *Pliers*, &c., may be had of Knight, Foster-lane, Cheapside.

23. *Braces* or Cramps, and *Pins* (15) bent at their points like bayonets with (24) the *Pincers* invented by Mr. WARING, of Liverpool, for setting legs of Beetles, &c.

25. *Setting Boards*, lined with cork and washed with flake white and isinglass, and some lines ruled at right-angles, so as to set the insect *true;* also a line marked into inches and lines, and if a large box were divided, the box or cage containing the setting boards on one side, and the *larva* cage on the other, with a *glass* partition; the other sides covered with wire-gauze, and *under* this in the travelling box should be

26. The *Travelling Store Box*, made to fit the size of the two above boxes. There should be a partition (with a sliding cover) with smaller divisions for pliers, setting-needles, camphor, matches, a wax candle, JONES's Lucifer-box, gum-bottle, &c. Also Tortrix and Tineæ pins, the places for them being lined with cork to save their points. Camel's-hair brush, card-paper, &c.

27. *Pocket Magnifier.*—May be had of Messrs. BENTLY and CHANT, No. 1, King's-Head-Court, St. Martin's-Le-Grand, opposite the New Post-Office. It is the common pocket magnifying-glass used by botanists.

28. *Pocket collecting Box*, should be made or covered with tin, to keep the insects cool, and prevent their drying too fast on a very hot day. It should contain a little camphor and muslin.

29. *Pocket Larva Box.*—It is very objectionable except when well lined with paper. A tin box perforated with holes is better upon the whole.

30. *Breeding Cages.*—These should have two bottles for the plants to be changed alternately, and for the larvæ to crawl to the fresh herbs. The late Captain BLOMER suggested (through the Rev. W. YONGE) fresh-cut turf and saw-dust for the bottom of the cages. They should be kept in a cool moist place, as in a cellar or out-house, during the winter. The bottom to be covered with fine mould, sand, and rotten wood from old Pollard trees, to the depth of several inches, and kept moist. Such Moths as are inclosed in a hard case or shell, as the Puss, Goat Moth, &c., should be carefully freed from it, as the aperture which the insect naturally makes is so small as not to permit it to pass without injury. The late Rev. T. SKRIMSHIRE, for the purpose of rearing insects from the egg to the perfect state, had procured a number of tin boxes, about two inches square, two sides of which, and also the top and bottom, are of tin perforated with small holes; the remaining two are glazed; and one of the tin sides constitutes a door which slides in a groove. Twelve of these are placed in a wooden trough, partitioned off for each box about a quarter of an inch deep, and made perfectly water-tight. Only one caterpillar, or a brood, is placed in each of these boxes,

which are numbered. A book is kept numbered to correspond with the boxes, and in which is entered the history of the insect from the day it is placed in the box. A little water is placed in each partition of the wooden trough, which serves to keep the food moist, as also the earth which is put into the tin boxes, that the caterpillar may undergo its metamorphosis in the most natural manner. Pupæ lay as deep as twelve or thirteen inches in the earth. If the boxes be sunk into a bed of earth or a Cucumber frame, the heat and moisture may accelerate the change. I had *S. ocellata* bred very early in this manner.

After a flood examine the *rejectamenta*. Mr. SKRIMSHIRE took several insects by carrying home two wheel-barrows full and putting their contents into a large washing-tub; amongst others some very rare, as *Aphodius plagiatus*, *S. quadridens*, &c. The north sides of mountains, or thick short Moss, are the best localities.

31. Mr. KIRBY'S *Plan of killing Insects.*—Fix in a small tin saucepan, filled with boiling water, a tin tube consisting of two pieces that fit into each other; cover the mouth of the lower one with a piece of gauze or canvas, and place your insect upon it; then fix the upper one over it, and cover also the mouth of this with gauze; and the steam from the boiling water will effectually kill your insects.—Captain BLOMER applies the insect to the steam from the spout of a Tea-kettle.

32. *A large Lump of Ammonia* put into a tin box will quickly kill any Lepidopterous insect [including the Moth and Butterfly families, &c.—ED.] if the box shuts close. A piece of paper should be put between the insect and the ammonia. Put no pin in or it will corrode. The pins used for setting should be longer than the others.

33. Mr. DENNY, of Cambridge, has a piece of cork with grooves for the body and legs of Moths, and the wings are then set by braces, &c. Introduce a stalk of hay or a horse-hair into the abdomens of *Libellulæ* [Dragon-flies.—ED.], or draw a piece of coarse cotton through with a needle two or three times till quite clean. Then cut it off at both ends.

A glass tube may be used in killing insects, putting the sharp end into the thorax, and blowing therein some spirits of wine.

See the *Magazine of Natural History*, Vol. IV., pp. 145, 436, and Vol. VI., p. 155.

Rev. Mr. Lockey's Plan of taking Insects.—Finally, to revert once more to the capturing of insects, I may observe, that Mr. LOCKEY has a double casement for taking insects by the lamp, so that even in cold weather he may sit up late at night, and when a Moth comes against the window, by touch-

ing a spring the outer window closes, and the Moth, if common, may be allowed to escape by re-opening it, or, if rare, the *inner* window is opened, and the Moth secured.

34. This is a kind of quiver for nets.

Glanville's Wootton, Dorsetshire,
Dec. 12, 1837.

FLOWERING PLANTS FOR FEBRUARY.

By Mr. T. B. Hall.

Common Snowdrop, *Galanthus nivalis;* Henbit Dead-nettle, or Great Henbit, *Lamium amplexicaule.*

[Mr. Hall having favoured us with a list of the flowering plants for each month in the year, we propose publishing a portion in each succeeding number, inserting each list in the number of *The Naturalist* for the month to which the plants relate, *i. e.* in which they flower. The catalogues will of course increase in length till about the middle of the year, when they will gradually wane till the return of Christmas again deprives the meadows and groves of the charms of Flora.—Ed.]

CORRESPONDENCE.

Observations on the Bitterns.

To the Editor of The Naturalist.

My dear Sir,—I have just been examining two Bitterns, in the stomach of one of which I found two Dace, and in the other the remains of some other fish, together with those of Coleopterous insects, among which I distinguished parts of *Geotrupus stercorarius;* and therefore these birds are more piscivorous than I was aware of when writing my paper "On the Bitterns" (p. 72). I was also wrong in asserting that the tame specimens in St. James's Park had become less nocturnal having been deceived by their coming forth so readily at the call of their feeder. On subsequent occasions, when I have been by myself on the island, I could never find them, as they were doubtless sitting crouched among the bushes.

I may further observe, that the Spoonbills and Ibises, besides possessing the

doubly emarginated sternum of the *Scolopacidæ* [Snipe family.—Ed.], have likewise the facicula of the same arched shape, and not anchylosed with the sternal crest, whereas the contrary is the case with the Storks and Herons. These four groups also mutually differ in the number of vertebræ, which in *Ardeidæ* [Heron family.—Ed.] at least, is constant throughout the group.

I remain, yours truly,

North Brixton, Surrey, EDWARD BLYTH.
Dec. 23, 1837.

GLOSSARY OF BOTANICAL TERMS.

DEAR SIR,—Could your Magazine be made the medium of publication of a glossary of scientific terms for Botany? I am not aware of any published that explains HOOKER's terms for the last two volumes of his *Flora*, containing Mosses, &c. &c., except at the end of LOUDON's large work on English and foreign Botany; and who would buy that for the sake of the glossary? but an excellent botanist informs me that it is the only published list of the terms now in use. He says he wrote it all out, but my other engagements preclude me from that task. Can you, therefore, get any one to furnish you with a list, or can you inform me if I could procure one, as in *Cryptogamia* I am quite at a stand-still for want of it.

I remain, dear Sir,
Yours respectfully,

Woodside, Liverpool, T. B. HALL.
Dec. 23, 1837.

[Each number of MAUND's *Botanist* (GROOMBRIDGE), published monthly, contains a portion of a glossary of botanical terms. Nevertheless, if any competent zoologist or botanist who can spare the requisite time, will transmit us a glossary of the technical terms employed in the illustration of the animal and vegetable kingdoms, the pages of *The Naturalist* will, in compliance with our correspondent's request, readily be opened to its insertion.—Ed.]

ORNITHOLOGICAL NOTES.

To the Editor of the Naturalist.

SIR,—In the fourteenth number of *The Naturalist*, published in November last, Mr. SALMON inquires, in the Chapter of Criticism (Vol. II., p. 423), whether the Grey Crow ever builds its nest in this neighbourhood? I am sorry that, from unforeseen accidents, his question has remained so long unanswered; nor am I aware how the mistake could have arisen, unless the careless hurry in which I wrote gave rise to that as well as to another slip of the pen to which you have

affixed your own remarks. The Hooded Crow (*Corvus cornix*) does not, to my knowledge, build in Lincolnshire. The Carrion Crow (*Corvus corone*) is the species alluded to as sitting on the 10th of April. In the same article read Whistling Plover (*Charadrius pluvialis*) for Stone Thicknee (*Œdicnemus crepitans*). Mr. Salmon is most probably right in his remarks on the structure of the Kingfisher's nest, as the one referred to by myself, at page 274, is the only specimen I have had an opportunity of examining, and which certainly appeared to me to be a regularly-formed nest. When remarking that it was not very unlike that of a Thrush, I alluded to the thickness of the walls of the nest, and the clay intermixed with the fishes' bones, and not to the compactness of the structure.—I hope, in accordance with Mr. Dillon's wish, some further remarks will be made by your correspondents on the position of the Goldcrest's nest. That it is open at the top, that it is built sometimes without the appearance of any cordage whatever, and also that in some positions it only uses the cord of moss partially, is certain; but that it *never* uses it entirely to support the nest, I believe I am not guilty of saying; though certainly in the cases that I have examined it has not been so.

Distribution of the Corn Bunting.

Over every part of the North Wold of Lincolnshire the Bunting (*Emberiza miliaria*) may be considered a common bird. And though I agree with Dr. Liverpool that it is a species much overlooked on account of the brown hue of its plumage, yet I cannot but differ from him in the effect which this produces. For as far as I can judge, *E. miliaria* is more frequently mistaken for *Alauda arvensis* (for the name of Lark is universally given to this species; vide also Jenyns's *Ornithology of Cambridgeshire*, p. 16) than other brown birds for *E. miliaria;* and to casual observers this would render the species more scarce than it is in reality. I cannot think either that any comparison can be drawn between this and the Yellow Bunting (*E. citrinella*), in as much as the Corn Bunting is partially migratory, and in a great degree local. During spring this bird is numerous, particularly frequenting the cut hedge-rows near road-sides in which single bushes are left standing. From the top-most branch of one of these the Bunting may be heard pouring forth his song; when disturbed he flies, or rather soars, with his tail and wings expanded, and his legs hanging down until he approaches the next bush; when commencing his song he rises slowly until he alights on the highest twig, where he finishes his short but not unmelodious strain. During July they become comparatively scarce; probably they retire to more unfrequented places to breed, for, as Mr. Salmon observes, "they appear late in their nidification." In the last week of August and during September the young collect in flocks, and may be found in almost every field in numbers.

Every Turnip-field as well as stubble has its share of them settling on the leaves of that plant. I am not aware what food they obtain from the Turnip. Perhaps some of your correspondents can give information on this point. In the depth of winter, and during severe snow-storms, they almost to a bird disappear. In answer to Dr. LIVERPOOL's query, I should say that the term "common" is not unaptly given to this species. *E. schœniclus* and *E. nivalis* (in this neighbourhood), &c. &c., are certainly less numerous, and, excepting during its partial migrations, it equals, if not exceeds, in number *E. citrinella*.

FURTHER NOTES ON BIRDS.

On Thursday last, Dec. 7, I procured a specimen of the Common Robin, in which both the wings and tail were white. I believe it to be the same bird I mentioned in a former number (Vol. II., p. 327), though at that time only the wings were white. The Grey Crows, Wild Geese, and Fieldfares are more numerous this year than usual, and arrived rather earlier. The common Wild Duck, and various other species of water-fowl, seem almost banished from this part of Lincolnshire, and which, according to CAMDEN, were once so common. "All this tract over at certain seasons, good God, what store of fowls (to say nothing of fishes) is here to be found, &c. &c. . . . . . I mean such as we have no Latin names for, the very delicate dainties, indeed of service meates for the demigods."

I remain, yours truly,

Swinhope House, Lincolnshire, R. P. ALINGTON.
Dec. 9, 1837.

CHAPTER OF CRITICISM.

MISTAKE IN A COMMUNICATION BY THE REV. F. O. MORRIS.

To the Editor of the Naturalist.

DEAR SIR,—Mr. MORRIS has mentioned (Vol. II., p. 490) *my* authority for a hybrid between the Pheasant and Grouse in EYTON's *Rarer British Birds*. If he can prove that *I* informed him so, I will make him a present of that book which I never saw!!! I have WHITE's *Selborne*, where there is a plate like the above. I may have told him of that, but deny that I did of EYTON's.

I am, dear Sir,
Yours truly,

Glanville's Wootton, Dorsetshire, J. C. DALE.
Dec. 12, 1837.

Critical Remarks on Mr. Dale's Dorsetshire Fauna.

To the Editor of the Naturalist.

My dear Sir,—I could wish that Mr. Dale, in his Dorsetshire Fauna (Vol. II., p. 171), had entered more into particulars when he speaks of such rare birds as the Great Auk, &c., occurring in Dorsetshire. He remarks of the Harvest Mouse that it is "sometimes reddish." Did he ever see it otherwise? I suspect not.—I am of opinion that there are no distinguishable characters between the Rats and Mice.* Taking the Brown Rat and House Mouse as types, the Black Rat would pertain to the latter, and the little Harvest Mouse to the former!—Respecting the Grey Wagtail (*M. boarula*), I should be glad to know at what season it is common at Glanville's Wootton. Some breed in Devonshire and Cornwall.

Yours truly,

North Brixton, Surrey, Edward Blyth.
July 4, 1837.

[For some reason unknown to us, the above letter, dated July 4, only came to hand on the 19th of November!—Ed.]

Extracts from New English Publications.

To the Editor of the Naturalist.

Sir,—As a reader and an admirer of your interesting Journal, *The Naturalist*, I beg to suggest, as an improvement—supposing it to be agreeable to yourself and your subscribers—that you should occasionally introduce extracts from new English books and periodicals. Leaving this point to your consideration,

I am, Sir,
Your obedient servant,

Taunton, Jan. 1, 1838. G. H. Wynne.

[In Vol. II., pp. 395 and 496, our correspondent will find extracts from English works, and we are constantly on the look-out for scattered notices of interest in periodicals and newspapers, for our Chapter of Miscellanies. This we shall continue to do as heretofore.—Ed.]

Brief Reply to Mr. Sweeting.

To the Editor of the Naturalist.

Sir,—I must really find fault with you for thinking it possible that I could be in any way offended with my good friend Mr. Sweeting's letter (Vol. II., p. 367). I have too great esteem for him to entertain towards him any but the most

* This, it will be perceived, relates to a note of our own.—Ed.

kindly spirit. Nor should I hope to entertain any other feeling towards any one else, for freely expressing his opinions, however much they might differ from my own, particularly when expressed as Mr. SWEETING has expressed his. I certainly do not think that he has *answered* my remarks; but let that pass; your readers will be able to judge, if they think it worth while to look and see. I am only sorry that my few remarks should have been so misapprehended as I fear that at all events to some extent they have been. I know no where a more enthusiastic an admirer of Nature than Mr. R. H. SWEETING, nor anywhere a more diligent and proficient student in all that relates to the glorious wonders of Creation.

I remain,
Yours faithfully,

Doncaster, *Dec.* 30, 1837, FRANCIS ORPEN MORRIS.

[We have no reason whatever to call in question the truth of Mr. MORRIS's statements as given above; but they have no power of altering our opinion respecting certain parts of his letter at p. 367 of our second volume. We doubt not Mr. SWEETING will be satisfied with the explanation of Mr. M.—ED.]

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

LEEDS ZOOLOGICAL AND BOTANICAL GARDENS.

THE Society formed to promote this great ornament and advantage to the town met on Monday, Dec. 18, at the Philosophical Hall, to receive the Report of the Provisional Committee, and to decide upon the laws and elect officers.—JOHN MARSHALL, Esq., presided, and the attendance of members was exceedingly respectable. Mr. EDDISON, Secretary, read the Report of the Provisional Committee, which stated, that they had purchased an exceedingly eligible piece of land between Headingley and Burley, consisting of about twenty acres, for the sum of £4,300; that the subscriptions now approached to £10,000; that the production of plans for laying out the Gardens had been offered to public competition, and that the successful competitors, among seventeen, were Mr. BILLINTON, architect, and Mr. DAVIS, gardener, both of Wakefield; that the estimated cost of laying out the Gardens on this plan would be more than the sum now subscribed, but that it was earnestly hoped the subscriptions would be so far increased as to prevent the necessity of any injurious curtailment of the plan. In conclusion, the Committee congratulated the Society and the town upon the formation of an establishment which, while they trusted it would contribute to

the advancement of science, would at the same time afford to all the means of innocent and healthful recreation. The Report having been received, Mr. Eddison read over the proposed laws, which were of considerable length, and which had been digested with much care by the Secretary and the Committee. They were afterwards read again seriatim, and passed with some amendments proposed by Mr. Bond and others. It was determined that at present there should be no annual subscribers, and that therefore the only persons entitled to all the privileges of the Gardens should be the shareholders—the shares being of the value of £10 each. It was also resolved that visitors should be admitted to the Gardens on payment of a shilling, and children on payment of sixpence; and that the Council should be empowered to admit visitors on still lower terms on particular days of the week, if they thought proper—this being intended to facilitate the admission of the working classes. We believe it is intended speedily to publish the laws at length. The following are the names of the Officers and Council chosen :—

OFFICERS.

President, ... John Marshall, Esq.

Vice Presidents, . . . James Williamson, M.D.; John Gott, Esq.; Rev. James Armitage Rhodes.

Treasurer, ... Charles Barr, Esq.

Curators in Zoology, Thomas Pridgin Teale, Esq.; Thomas Nunneley, Esq.

Curators in Botany, H. C. Marshall, Esq.; Edward Bond, Esq.

Secretaries, ... Robert Barr, Esq.; Edwin Eddison, Esq.

Auditors, ... Samuel Jowett Birchall, Esq.; Joseph Henry Ridsdale, Esq.

COUNCIL.

Mr. Robert Arthington
Mr. Edward Baines, jun.
Mr. Robert Benson
Mr. Edwin Birchall
Mr. Robert Dennis Chantrell
Mr. Robert Derham
Mr. Sparke George
Rev. Joseph Holmes
Adam Hunter, M.D.
Mr. Charles Kirkby
Mr. Chas. Gascoigne Maclea
Mr. Robert Perring
Mr. Richard Pyatt
Mr. Hatton Hamer Stansfeld
Mr. Edward Tatham
Dinsey Lander Thorp, M.D.
Mr. William Watson
Mr. William West
Mr. William Wildsmith
Mr. John Wilkinson
Mr. William Willock.

It is extremely desirable that the sum for carrying out the beautiful plan obtained by the Committee should be raised. Not less than £20,000 will be required to execute the plan well, and to leave a proper reserve for expenses. At Sheffield the sum of £23,000 has been raised for the same purpose; and surely Leeds ought not to be behind Sheffield.—*Leeds Mercury*, *Dec.* 23.

CHELTENHAM HORTICULTURAL AND FLORAL SOCIETY.

This Society held its annual meeting on Tuesday, Dec. 12, when a statement of the receipts and expenditure was read to the members by the chairman, Major Nutt. From this statement it appeared, that the income of the last year had exceeded that of the preceding one by above £20; and that, after defraying the expenses of the exhibition, and the current gratuities, there remianed £35 to be apportioned as prizes among the successful exhibitors. A proposition was submitted to the meeting by the secretary of the Gloucestershire Zoological, Botanical, and Horticultural Society, for uniting the two Societies, and for holding the future floral exhibitions under the auspices of, and in connection with, that Society. As this proposition had, however, been brought forward without any previous intimation of an intention to do so having been given to the members generally, it was considered advisable to postpone the decision of the matter to a future meeting, to be specially convened for the purpose; and in order to give it that due consideration which a proposition of such importance required, a committee was appointed to inquire into its practicability, and to confer with the Committee of the Zoological Society on the subject.—*Cheltenham Looker-On*, *Dec.* 16.

CHELTENHAM LITERARY AND PHILOSOPHICAL INSTITUTION.

On Tuesday evening, Dec. 12, Mr. R. Wolseley delivered the first of a short course of lectures on the science of Mineralogy. In his introduction, the lecturer endeavoured to impress upon the members the necessity of their contributing to the instruction of each other by making known from time to time those principles and discoveries of science, for the spread and dissemination of which the Institu-

tion of which they were members had been especially formed. For though all might not be able to serve up the rich banquet of the professor, yet the humble fare of the noviciate would oftentimes be found highly acceptable to those whose appetite for knowledge had not been cloyed by the high-seasoned discourses of the installed philosopher. Having offered some prefatory remarks on the study of Mineralogy, Mr. Wolseley proceeded to show its connection with, and relation to, Geology, which was considered as the primary science, inasmuch as it embraced the entire mass of the Globe, with all its multiform varieties of earths, minerals, &c. &c. The lecturer here pointed particular attention to the arrangement of these various substances; and showed how greatly the researches of scientific men in this department of knowledge had contributed to the comforts and enjoyments of mankind, of which Coal was instanced as a striking and familiar example. He again adverted to Geology as comprehending the study of the general arrangement of the earth's crust, and of the various series of rocks, deposits, &c., Mineralogy taking cognizance only of the component parts of the general mass. Before any advancement could be made in the latter science, it was indispensable that its leading features or characteristics should be well considered and understood. He then proceeded to give divisions of the rock and mineral masses into four classes :—Earthy—Saline—Inflammable—Metals, and to treat of them under two heads :—the External or Physical, and the Internal or Chemical. The former he again divided into twenty characteristics, as *form*, *structure*, *hardness*, *colour*, &c. &c.; and in speaking of the latter, he explained those crystalline forms of most frequent occurrence in the Mineral Kingdom, showing, that from a system of four simple forms all the compounds of crystals were obtained. The method of measuring the various angles of crystals by the goniometer was explained, and the process of dissection so as to arrive at the primary crystals fully described. The lecture was illustrated by appropriate diagrams, and by numerous specimens of the various minerals alluded to.

On Tuesday, Dec. 19, Mr. Wolseley delivered the second lecture of his course on Mineralogy, and took a rapid view of the leading features of the former lecture, resuming the consideration of his subject by replying to the queries often propounded by beginners in Geology—"Whence comes it that primitive rocks are found on the tops of mountains? and why the same stratified rocks along the same line of country are found dipping some north and some south?" Briefly explaining these phenomena, Mr. Wolseley next proceeded to elucidate the physical characters, as lustre, colour, &c., of certain minerals, the accidents and causes producing which were severally described, and a variety of familiar instances produced in illustration. The lecturer then proceeded to consider and explain the methods employed for ascertaining the specific gravity of minerals, entered into a description of the hydrostatic balance and the areometer, and adverted to

the uses of the blowpipe, and its application generally to the purposes of Mineralogy. A short analysis of the scientific arrangement of minerals into classes, &c., was given, and the lecturer concluded with a few remarks preparatory to entering upon the separate description of each mineral, more particularly those indigenous to our own country.

Mr. Wolseley delivered his third lecture on Mineralogy at this Institution on December 26. Resuming his subject at the point at which he closed the preceding lecture, Mr. W. proceeded to consider the specimens found in the mineral kingdoms, under a classification of nineteen orders, giving descriptions separately of such individuals as are indigenous to the country. He noticed the chief physical characteristics of the whole, and the localities whence they are principally procured, and with what substances generally combined and associated. He next gave a detail of the uses of such as are most commonly available to the comforts and wants of man, and entered into a description of several, particularly of calcareous spar, and the several formations of the carbonate of lime. He then proceeded to describe the several orders of Ore Metal, Pyrites, &c., giving a history of the species contained under each order respectively, and more especially of such as are procured in the mines of this country, and the various uses to which the metals are appropriated. He examined also the different orders of Gem, Malactrite, Spar, &c.; and in conclusion directed attention to those species which are most frequently met with in Great Britain, and briefly adverted to the purposes to which they are applied.

Jan. 2.—Mr. R. Wolseley completed his course of Lectures on Mineralogy by the delivery of the fourth lecture of the series.

Having in his three preceding discourses treated of the peculiar characteristics and properties of various minerals separately, explained their classification, and analysed their constituent properties; Mr. Wolseley, in his present lecture, proceeded to describe those vast repositories in Nature, whence the greater portion are obtained, and whence, consequently, so much of the wealth of the country is derived, namely—the mines. These, after a few prefatory remarks, the lecturer divided into three kinds—*Salt*, *Coal*, and *Mines of Metallic Ores.* He entered into an interesting and minute description of the Salt-mines, described their general depth, and the relative position which they occupy in the crust of the earth, their extent, and the sum of their annual produce, and pointed out the localities of a few of the most celebrated. The general history and description of Coal-mines were next given, and *Lodes* or *Veins* described. A minute account was then given of the principal *Iron*, *Copper*, and *Lead-mines*, and of the *Mines of precious Metals* generally, the strata in which the several ores were found, and the manner in which the mines were worked; and the lecturer

concluded with a description of the various processes employed in dressing and preparing the different ores for smelting, and finally for the public market.

The attendance upon these lectures has not been throughout so numerous as we could have wished; for though the subject was not, possibly, the most popular that could have been selected, the information which was conveyed was of that kind which could not fail of interesting a large class of the population of a country so rich in mineral productions as Great Britain.——*Cheltenham Looker-on.*

GLOUCESTERSHIRE ZOOLOGICAL, BOTANICAL, AND HORTICULTURAL SOCIETY.

THE first annual meeting of this society took place Jan. 1, 1838, at the Rotunda. H. N. TRYE, Esq., the High Sheriff of the County, having been called to the chair, the Secretary proceeded to read the report of the Sub-Committee of Management, which took a review of the principal objects which during the past year had engaged the attention of the Managers, and gave a highly satisfactory account of the progress that had been made in the various works, and the present state of the Gardens. The Committee having limited their operations to a portion of the design, speak with great confidence of their hope that this portion will be in a sufficiently advanced state by Spring to justify the opening of the Gardens on the 24th of May, the anniversary of their commencement and the birth-day of the Queen. A circumstance was adverted to in connection with the quality of the soils composing the Gardens, the report of which is of so much importance to those who are interested in the success and prosperity of the undertaking that we think it cannot be too generally known; we therefore feel it incumbent to give the passage alluding to the subject as near as may be in the precise words of the official document:—

"The Sub-Committee deem it right to inform the Shareholders in this undertaking, that while engaged in excavating and cutting through the ground for the insertion of these various drains and watercourses, they had an opportunity afforded them of verifying the report of the scientific gentlemen who at the formation of this Society examined the ground, for the purpose of ascertaining its adaptability to the purposes for which it was designed; the only important variation from that estimate which they observed being in the extent of the underlying sand beds throughout the ground, which, they have great pleasure in stating, were found upon examination to contain a much larger proportion to the other soils than was at first expected. In these sand beds a number of springs were discovered, the streams from which have been carefully collected and conducted into the lake, thus securing to that important feature an abundant supply of fresh water, and thereby rendering the Gardens in some measure independent

of the means originally secured from the neighbouring spring in Moorend Grove, and which it has been provided, in the deed of purchase, shall be conducted through the gardens."

At the conclusion of the Report an abstract of the Society's receipts and disbursements during the year was submitted to the meeting. By this it appeared, that the former amounted to £2,115, and the latter to £2,054 10s. 8d., including a payment of five hundred pounds on account of the purchase money for the land.

The reading of these official papers being over, Dr. Baron, in a brief congratulatory speech, in which he also alluded to the importance of carrying out the designs of the society more extensively than appeared yet to have been done, and especially in respect to the formation of a museum, moved the first resolution —" That the Report and Financial Statement should be adopted and printed," which, having been seconded by the Rev. C. B. Trye, was carried *nem. con.*

The second resolution, which was one of thanks to the Committee of Management for their valuable and gratuitous services, was moved by Dr. Boisragon, and seconded by Dr. Cannon, both of whom bore testimony to the zeal and abilities which the gentlemen constituting the Sub-Committee of Management evinced in carrying out the designs of the Society. The names of the five retiring members of the Committee were then announced by the Secretary, and the meeting proceeded to elect others to fill their place, when Dr. Cannon, Mr. Skillicorne, Mr. C. Baker of Painswick, Mr. Billings, and Mr. Bubb were proposed, and elected without opposition. The appointment of auditors and other routine business next followed, and the proceedings of the day closed with a vote of thanks to the Chairman, who acknowledged it in a short address, at the close of which the meeting separated.

ORNITHOLOGICAL SOCIETY.

Dec. 1.—Mr. Bartlett exhibited two specimens of Gulls he had lately obtained in the London market, one a male of the year, corresponding to *Larus glaucus*, Auct., the other a female of the preceding year, intermediate in size between *L. glaucus* and *L. Islandicus*, but which he conceived to be identical with the first, although a considerable difference existed in the structure of the breast-bone, which, in the larger and younger bird, would in the course of a few weeks have become only singly emarginated at its posterior edge, whereas the other retained two distinct emarginations, as ordinarily observed in this genus. He was unwilling, till he had examined more specimens, to come to any decision respecting the special identity of his two birds, but, judging from the specimens he had examined in the British Museum and Zoological Society's Museum, he was very much inclined to think that the European *L. Islandicus*, Auct., was

respecting the birds, although the American specimen which he had seen unquestionably constituted a distinct species. He concluded by calling the attention of the Society particularly to the subject, wishing that those who had opportunities would endeavour to ascertain whether the bird corresponding to the American *L. leucopterus* of AUDUBON ever occurred in Europe.

EXTRACTS FROM THE FOREIGN PERIODICALS.

ZOOLOGY.

1. ON THE ANATOMY OF *Pentastoma tænioides*.—Some entozoaries, observes M. E. C. MIRAM, have already been studied under the double relations of Anatomy and Zoology; such, especially, as the *Trematodes;* but there is yet a great number of intestinal Worms known only by their external characters. The cause of this is, partly, their rarity, and also the difficulty of investigating them anatomically; this is particularly the case as regards *Tænia*, *Botryocephalus*, and other articulated reptiles.* Yet certain of these intestinal Worms, which do not present the same difficulties, as, for instance, *Pentastoma tænioides*, have not yet been the objects of accurate research; hence I here endeavour to present an anatomical and zoological account of this Worm, which I have often had occasion to observe in Dogs.

The external description of this animal is already sufficiently known, and I can only repeat it; but its anatomy has hitherto been performed in a manner so little satisfactory (perhaps because it is very rarely found in other countries), that a more intimate investigation of its organization has led me to considerations both new and different from those heretofore generally advanced. It is thus that we shall be enabled to recognize the intimate relations which connect this animal with *Cistoides* and *Echinorhynchus*, and to assign to *Trematodes* a more elevated station in the zoological series. CUVIER described in a few words the nervous system of this Worm; but those parts relating to its intestinal canal, &c., appear to me inaccurate.

Pentastoma tænioides (RUDOLPHI)—or *Tænia lanceolata* of CHABERT—belongs, according to RUDOLPHI, to the order *Trematodes*.

The colour of the living animal is dirty yellow; it is white after death, but regains its natural hue when immersed in alcohol.

* It is not clear in what sense M. MIRAM here employs the words "*vers annelés*," and we therefore consider it most prudent to translate them as above, so as to include the four tribes characterized in the *Règne Animal*.—ED.

The length of the male is from eight to ten lines. That of the female, on the contrary, is five—or, according to CUVIER, even six—inches. I have further observed that specimens taken from Wolves are invariably larger than those obtained from Dogs.

As regards the parts in which the Worm lodges, it has been met with in the frontal sinuses of Dogs, Wolves, Horses, and Mules. The specimens which I shall describe were also obtained from the frontal sinuses as well as from the ethmoidal cells of the Wolf and Dog; I have found them in considerable numbers in both these parts, and even in the month of March in the first, while I have seen them in the latter only in June. I have collected from a Wolf three females and four males, and from a Dog four of each sex, a circumstance the more surprising as it is known that the males of most intestinal Worms are very rare. Diligently as I have sought this animal in Horses, I have never yet succeeded in finding it.—*Annales des Sciences Naturelles, troisième Année.*

2. ON THE MUCOUS BODY, OR COLOURING TISSUE OF THE SKIN, IN THE CHARRUAN INDIAN, THE NEGRO, AND THE MULATTO.—M. FLOURENS (*Acad. des Sciences, Dec.* 12, 1836) has profited by the death of two of the Charruan Indians brought to Paris in 1832, to study their organization, and the special object of his paper is the structure of the mucous tissue of the skin.

After tracing the history and actual state of science on this delicate anatomical point, M. FLOURENS announces that he has discovered, between [the [lower skin and the epidermis four distinct layers; the first placed on the proper skin, the second containing the colouring matter, and the fourth layer or third membrane placed between the cuticle and the *pigmentum*, or coloured tissue.

The first of these membranes, continues M. FLOURENS, that situated under the dermis, is cellular, and disposed in coats or in net-work.

The second, of the nature or at least of the consistency of ordinary mucous membranes, is continuous. Its external surface bears the colouring matter. The internal surface is studded with prolongations traversing the holes of the cellular membrane, and attached to the dermis.

These prolongations are very remarkable. They form the sheath of the hairs, pass under their roots, appear to constitute the internal plate of their bulb, and only exist where there are hairs.

It should not be forgotten that, at a certain degree of maceration, the pigmentum detaches itself from the membrane of which I have been speaking, and remains attached to the following, which I am about to describe.

The pigmental membrane itself is nearly of equal consistency throughout, and sufficiently thick to be divided into two leaflets, one of which may be the plates of CRUIKSHANK; for CRUIKSHANK has not characterised his plates, a circumstance which renders his fine work incomplete.

Turned back on its external face, and this face being charged with pigmentum, the membrane obtains, on its internal surface, a bluish tint; deprived of the pigmentum, it is yellowish. The cellular or areolar membrane is also of a yellowish hue, but less intense. The epidermis is ash-coloured. The dermis alone is white.

I have already said that the pigmentum is only a single layer, a covering, a deposit, and not a membrane.

The membrane which covers it is a true continuous membrane. It is the internal layer of the cuticle.

M. Flourens has discovered all these parts in the skin of the negro and the mulatto, and has succeeded in obtaining them by macerations more or less prolonged.

In white men this dissection is much more difficult. M. Flourens has there found a double epidermis, but all his endeavours to discover a mucous body have been in vain. Whether this mucous body is wanting in the white race, whether the maceration should be conducted in a different manner, or replaced by another process, he has failed in discovering between the dermis and cuticle any other layer than the membrane of the internal epidermis.—*Bibliothèque Universelle de Genève, première Année.*

BOTANY.

3. Sleep of Flowers.—In our last number (Vol. III., p. 42) we left M. Dutrochet advancing the following statement:—" It might be concluded, since the expansion of the flower is owing to the turgescence of the cellular tissue of its nerves, that its closing or its sleep was due to depletion of the same cellular tissue; but experience proves that such is not the cause of the sleep of the corolla." We now proceed to supply his reasons for the above statement.

I separated a nerve of a corolla about to expand, and immersed it in water. This nerve (curved slightly inwards, as in the corolla while in bud) is powerfully forced outwards—the mode of incurvation which effects the expansion. Endosmose, then, determines the turgescence of the cellular tissue, the organ of this incurvation. After an immersion of about six hours the nerve ceased its outward curvation, and began to curve inwards; in a short time it was entirely rolled spirally in this new direction, that of incurvation, to which is due the sleep or closing of the flower. This succession of phenomena is altogether independent of the action of light. Thus the nerve of the corolla of *Mirabilis* takes in water the incurvation which effects the sleep of the flower, and it then takes, after a certain time, the incurvation which causes the opening of this same flower. If, then, it is the turgescence of the cellular tissue of the nerves that produces the incurvation to which the expansion of the corolla is owing, the incurvation to

which the sleep of the corolla is due must be referred to an entirely different cause; for it cannot be admitted that there was depletion of the cellular tissue plunged into the water. The experiment related above proves that it is the fibrous tissue contained in each nerve of the corolla which is the agent of the inward curvature, the incurvation which causes the sleep or shutting of the corolla.

It must therefore be acknowledged, that in the nerves of the flowers of *Mirabilis*, the *incurvation of sleep*, or the incurvation of which the concavity is directed outwards, and which is due to the turgescence of the cellular tissue, first carries it by its force upon the *incurvation of sleep*, or that incurvation the concavity of which is directed towards the interior of the flower, and which is due to the action of the fibrous tissue; and that the *incurvation of sleep*, due to this latter tissue, becomes finally victorious.

The incurvation outwards, which affects the cellular tissue during the immersion of the nerve in water, directs the curvature outwards when the nerve is plunged into syrup; this proves that here endosmose is the agent. But when the nerve, immersed in water several hours, has taken the second incurvation—that of sleep—it by no means loses it when transferred to the syrup. It is, therefore, not endosmose which occasions the incurvation of sleep.

By reflecting on this singular phenomenon, I was led to believe that it was not without reason that Nature had lavished respiratory organs on the fibrous tissue, which is situated between two series of hollow organs filled with air. Since it was not by *impletion of fluid* that the fibrous tissue attained its state of curvature, it might be by *impletion of oxygen*. If this suspicion be well founded, the nerve which is immersed in aërated water, there first adopts outward incurvation, which is that of opening, and which afterwards takes the inward incurvation, or that of sleep, this nerve, I say, plunged into non-aëriated water, should always retain its first outward curvation, which is that of waking, an incurvation due to the endosmose of the cells of the cellular tissue; this nerve would thus never exhibit inward curvature, which is that of sleep, and which I believe to be owing to the oxygenation of the fibrous tissue.

I ought here to observe, that when a thin vegetable substance is immersed in non-aëriated water, the latter quickly dissolves the air contained in the pneumatic organs of this vegetable substance, and takes the place of this air, so that there is no longer any oxygen in this vegetable matter.

Experience justified my anticipations. The nerve of a corolla of *Mirabilis*, immersed in non-aëriated water, took and always retained its incurvation of waking. An expanded flower which, plunged entirely in aërated water, adopted after several hours the dormant state, and did not attain this condition in non-aëriated water, always retained its expanded or waking state.

It might perhaps be imagined, that the air contained in the pneumatic organs of the nerves of the corolla, would act by virtue of its elasticity to produce the incurvation of sleep, and not by virtue of the chemical action of the oxygen it contains: hence it would be inferred that the incurvation of sleep would not take place in a corolla plunged in non-aëriated water, which dissolved the air contained in the pneumatic organs, and which takes its place. But it is not so: experience has proved to me, that the air never returns into the pneumatic organs occupied by the water, in the vegetable portions which remain sub-merged. Now, that does not prevent the corolla of *Mirabilis* from closing after two or three days, when the non-aëriated water in which it had been immersed expanded is allowed to aërate itself by contact with the atmospheric air. It is therefore undoubtedly by the chemical action of the oxygen dissolved in the water that the fibrous tissue acquires the power of incurvation which produces the dormant state. Thus, in the flower of *Mirabilis*, the waking and sleeping—that is the opening and shutting of the corolla—result from the alternately predominant action of the two organic tissues situated in the nerves of the corolla, and which curve in opposite directions, *e.g.*:—1. A cellular tissue which inclines to curve outwards, by impletion of fluid in excess, or by *endosmose*; 2. A fibrous tissue which tends to curve inwards, by oxygenation.—*Annales des Sciences Naturelles.*

CHAPTER OF MISCELLANIES.

ZOOLOGY.

Egg of the Cuckoo (*Cuculus canorus*, Linn.).—How is it that the egg of the Cuckoo, though large compared with those of the bird in whose nest it is deposited, takes only the same time for incubation? This is a curious subject, and one on which I should be glad to have even the *conjectures* of others. Wilson mentions a similar fact with respect to the egg of the Cow Bunting of America, but does not give any solution of the cause.—B. R. Morris, *Charmouth, Dorsetshire, Dec.* 17, 1837.—[Although as a general rule the largest eggs require longest incubation, there are many exceptions to the law. For instance, the eggs of the Goose and Duck—though differing very considerably in size—are hatched in a similar period. Probably the relative thickness of the shell, or the quality of the yolk, may have some influence; but we merely throw this out, as desired by our correspondent, in the way of "conjecture."—Ed.]

Notes on Birds met with near Plymouth.—The following birds have been found near Plymouth, to the mild climate of which neighbourhood the appear-

ance of some species is to be ascribed. Such casual notes on species may afford aid to the more general observers, and help to complete the British Ornithology :—

The Sparrow Hawk (*Falco nisus*, LINN.) is very plentiful and mischievous. Kestril (*Falco tinnunculus*, LINN.) not uncommon in autumn; it is generally seen skimming along one side of a hedge, and then in the contrary direction on the other side, in search of prey. The Hooded Crow (*Corvus cornix*, LINN.), frequent in winter, but departs in spring. The Cornish Chough [*Fregilus graculus*.—ED.] is often observed, but is by no means so common as further westward. In the mild January of 1796 (as I am told by one who remembered it) a Cuckoo was heard repeatedly in the grounds of Mount Edgcombe. The Swallow, the Bank Swallow, and the Swift are common. I have been told that there is often seen a species of Wren called the "White Wren,"* but it is a bird of passage only. The Godwit, or Redstreak [Qu. *Limosa rufa* or *L. melanura*?—ED.], is common, as well as the Lapwing in the season. The Grey Plover is occasionally seen. The Dabchick and Dobchick (Grebes) are plentiful. The greater and Lesser Terns, and the Gannet, are common. The Heron is abundant on the Tamer. The common sea-birds are in great plenty. The Woodcock is not so common as further to the westward, but in ordinary seasons is very far from being scarce. The Ash-coloured Harrier is seen but seldom. The great mildness of the climate makes this part of Devonshire the resort of species emigrating from the north in very genial seasons, when many do not perhaps go beyond this part of England at all.—C. REDDING, *Lichfield*, *Nov.* 20, 1837.

NOTES ON THE NEIGHBOURHOOD OF GODALMING.—The vale of Godalming is considered to embrace one of the most delightful views in the kingdom; and from the few opportunities I have hitherto had of judging, I should think that in the spring it must realize all that has been said in its favour. The 16th instant being fine, I was induced to take a ramble, principally with a view of gathering for my friends in Norfolk specimens of one of our most beautiful native evergreens, *Ruscus aculeatus*, to commemorate the approaching joyous season of Christmas. As I was pushing my way amidst the briars and brambles, I chanced to stumble upon an interesting incident in the shape of a little ball of grass curiously interwoven, lying on the ground. It was about eight inches in circumference, and on taking it up I soon ascertained, by the faint sound emitted from the interior (on my handling it), that it contained a prisoner. I bore my prize homeward for examination, and on making a slight opening, immediately issued forth one of those beautiful little creatures the Dormouse (*Myoxus avellanarius*). The heat of my hand, and the warmth of the room had completely

* This is perhaps a provincial name for the Whitebreasted Fauvet (*Ficedula garrula*), or "Lesser Whitethroat" of some authors.—ED.

revived it from its torpor; it appeared to enjoy its transition by nimbly scaling every part of the furniture in all directions. It experienced no difficulty in either ascending or descending the polished backs of the chairs, and when I attempted to secure it it leaped from chair to chair with astonishing agility for so small a creature. On taking it into my hand, it shewed not the least disposition to resent the liberty; on the contrary it was very docile. On being set at liberty it sprang at least two yards on to a table. I was much gratified in witnessing its agile movements. In the evening I placed my little stranger with its original domicile in a box, of which on the following morning I found it had taken possession, and again relapsed into a state of torpidity, in which condition I transferred my unconscious *sleeper* to a friend. I should think that by some accident its domicile had been displaced from the original situation, which was the cause of my finding it upon the surface of the ground,—J. D. SALMON, *Godalming, Surrey, Dec.* 23, 1837.

INSTANCES OF THE CAPTURE OF *Vanessa antiope*.—In Captain BLOMER'S Journal, under the date of June 1, 1833, he mentions having met with the Rev. Mr. WALKER, who told him of having seen a *flight* of *Vanessa antiope* pass over near Cheltenham, and that he took a few of them. Mr. SPRAGGE took one near Chard in 1834, and Mr. BAKER another (♀) at Bridgewater. One was seen in company with *V. atalanta* and *V. io*, flying over and settling on an empty sugar-cask in a grocer's yard there.—J. C. DALE, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

REMARKABLE FACT.—In the early part of last week, whilst a servant belonging to ROWLAND HIBBERT, Esq., of Lamb-Hill, near Sheffield, was brushing a hedge, he took off a bough which supported a Yellow Bunting's nest, and found four eggs therein in a forward state of incubation.—*Doncaster Gazette, Jan.* 12, 1838.—[That a bird seldom known, by the most experienced observers, to hatch before the beginning of June, or, at earliest, the latter end of May, should be possessed of a brood in the middle of a severe January, is indeed a "remarkable fact"—too remarkable, we think, for our readers to swallow without some doubts. We scarcely know what to make of several other newspaper accounts of Sparrows and Redbreasts building during the same month, while the snow was thick on the ground, unless we may suppose it to be a "wise ordination of providence," to husband the latent heat in their little frames! These, however, are birds which will always breed early when a favourable opportunity offers; but that a species which, like the Yellow Bunting, over whose family affairs variation of climate has no control, should, all on a sudden, be possessed with the desire of introducing its offspring into the world for the express purpose, as it were, of being starved to death—or, mayhap, of enlivening the columns of a provincial paper at Christmas-time!—at least requires further

confirmation than the above anonymous notice. Man is too apt to judge hastily of a thing which he has not himself had an opportunity to verify, and to think that because it is remarkable it must necessarily be absurd—as if nothing unusual were ever likely to happen. We, however, do not undertake to deny the truth of the above "remarkable fact," but, finding in our brain no explanation of the circumstance, either practical or theoretical, we trust we shall be excused if we remain sceptical for the present.—Ed.]

The Blood of Quadrupeds poisonous to Birds.—If blood with circular particles be injected into the vessels of an animal whose blood-corpuscles are elliptical, the most violent effects are instantly produced; such blood acts upon the nervous system like the strongest poisons; and death usually follows with extreme rapidity after the injection of a very small quantity. Thus, if a few drops of the blood of a Sheep be injected into the vessels of a bird, the bird is killed instantaneously. It is very remarkable that the blood of mammalia should be thus fatal to the bird. The effect cannot be dependent on any mechanical principle. The injection of a fluid with particles the diameter of which is greater than that of the papillary blood-vessels, would of course destroy life by stopping the circulation; but the blood-corpuscles of the mammalia are much smaller than those of the bird; yet the Pigeon is killed by a few drops of mammiferous blood; and the blood of the fish is rapidly fatal to all the mammalia as well as to birds.—Dr. Southwood Smith's *Philosophy of Health, Vol. II., p.* 430.

Prize-Essays on the Turnip-fly.—In Vol. III., p. 45, a correspondent makes inquiry with regard to prize essays on the Turnip-fly. Last summer twelvemonths the Saffron Walden Agricultural Society offered two prizes of £50 each, one for the best description of the economy and structure of the Turnip-fly, the other for the best essay on the mode of destroying this insect. I heard from a friend at Walden the other day, and he tells me that the prizes have not yet been adjudged. Further particulars can be obtained on this subject from Mr. Joshua Clarke, Saffron Walden, Essex.—Edwin Lankester, *Campsall, near Doncaster, Jan.* 12, 1838.

The Hen Harrier near Scarborough.—Specimens of this bird are repeatedly shot on the moors near Scarborough. They also breed there. One was very recently brought to me by Mr. Smith, gamekeeper at Hackness.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

Wild Swans near Ayr.—On Thursday last, a flock of nearly thirty Wild Swans were observed flying in a very compact body, and almost within gun-shot of the town of Ayr, directing their course southward, with the intention, perhaps, of visiting, during the winter months, some of the farms situate in our inland mountains. These feathered strangers inhabit the northern regions of the globe, and seldom leave those inhospitable climes to visit more southern latitudes, un-

less compelled by the severity of the winter. The Wild Swan has been poetically called "the peaceful monarch of the lake," because he does not prey upon any of the feathered tribe, living wholly upon roots, seeds, and small insects, and fears no foe that wings the sky. From these birds making their appearance in our country at this period of the year, it no doubt indicates that winter has commenced in their northern home with much intensity, and consequently there is some probability that we shall experience a very hard and inclement season. In the winter of 1835, three of these gigantic birds were killed at a single shot by a person in the parish of Ochiltree.—*Ayr Observer*, *Dec.*, 1837.

Addition to the Lancashire Fauna.—Mr. Scaife states, in the *Magazine of Natural History* for October, 1837, that two specimens of *Totanus ochropus* [the Greenshank Sandpiper.—Ed.] were shot near Blackburn, in Lancashire, in July and August, 1837. This species was omitted in my "Catalogue of Birds found in Lancashire" (Vol. II., p. 349).—Peter Rylands, *Bewsey House, near Warrington, Dec.* 26, 1837.

The Season.—Last week, a Strawberry, full ripe, was gathered in the garden of Mr. John Holme, Bellvue, West Derby.—*Preston Observer*.—As a proof of the mildness of the season, a Gooseberry bush in the garden of Mr. Bothwell, Greenbank, is covered not only with buds, but exhibits some well-formed berries. Many of the bushes in the garden are in the same state. Such a circumstance at this season is almost, we believe, without a precedent.—*Aberdeen Herald*.—A Robin's nest with four eggs has been recently discovered in a flue in the county Lunatic Asylum. The nest, with three of the eggs, is now to be seen at the Cross Keys Inn.—*Bedford Beacon*.—A Whin Chat's nest with twelve eggs was found in Carrock Fell on Christmas-day by two boys.—Cowslips were last week plucked in the neighbourhood of Norton, Yorkshire, and a Fig-tree at the Lord Seaham Inn, near Hartlepool, is now bearing fruit, being the third crop.—A Salisbury correspondent of a local paper relates that whilst walking in his garden on Christmas-day he observed a very beautiful yellow Butterfly, as full of activity as in the month of June.—*Doncaster Gazette*, *Jan.* 5, 1838.—[On the very day after the publication of the preceding paragraph in the *Doncaster Gazette*, the thermometer fell, according to Mr. Murphy's prophecy, below the freezing point, and continued to sink for a fortnight, with little intermission, at once blighting the hopes of those who, from age, illness, or other circumstances, had both desired and anticipated an extraordinarily mild winter. All indications of the *mildness* of the season have, accordingly, entirely vanished as regards the animal and vegetable kingdoms.—Ed.]

The Sense of Taste in Birds.—The seat of every sense is variously modified to suit the habits of the animal. Those birds which obtain their food by

probing the mud—where they cannot see or smell their prey—are probably guided to it by the sense of taste, which resides in the soft and delicate membrane extended over the bill, and which is very plentifully supplied with nerves. Such are the Ducks, Snipes, &c., and these birds alone can be said to have a true sense of taste. *Ornithorhynchus paradoxus* also has its bill covered with a highly organized membrane in the same way, and this probably performs a similar office for it that it does for the birds above-mentioned.—Beverley R. Morris, *Charmouth, Dorsetshire, Dec.* 17, 1837.

How to find the Larvæ of *Tortrix*.—The larvæ of some species of *Tortrix* may be found in winter by splitting open Teazle-heads.—J. C. Dale, *Glanville's Wootton, Dorsetshire, Dec.* 12, 1837.

Butterfly seen on Christmas-Day.—On Christmas-day the thermometer stood at 61°, and a neighbour informs me that he saw a large coloured Butterfly flying about in the church. I do not know what species this was—probably *Vanessa polychloros*. I have seen it at a lower temperature in March.—Edwin Lankester, *Campsall, near Doncaster, Jan.* 12, 1838.

Phrenological Society of Warrington.—With unfeigned pleasure we take this early opportunity of announcing the recent formation of a Phrenological Society at Warrington—especially after the confessions of a *learned* physician at the late meeting of the British Association, held in the same county. Phrenology has no longer cause for alarm: it rests on a sure basis, and interested or blind opposition will but serve to increase, if possible, the zeal of its numerous advocates. Even the most timid of its supporters no longer fear openly to avow their belief in this science, and although it can no more be expected that every man should be a phrenologist, than that we should all be chemists or naturalists, yet the time rapidly advances when he who still persists—despite the astounding mass of facts and arguments which court his attention—in opposing its grand truths, will be considered too ignorant or too bigoted to merit notice. When Metaphysics issued its mystic theories and vague speculations—alike destitute of beauty and of truth—when the most ordinary indications of character puzzled the brains of the wisest philosophers—what wonder if few felt inclined to wander through a fog so appalling in its density! But now that almost every difficulty is cleared away—since there is a system which not only explains anomalies heretofore inexplicable, but which can indicate, with the utmost minuteness, every shade of character—who will venture to affirm that he should not be the better for an acquaintance with at least the general principles of Phrenology? A phrenologist, in the true acceptation of the term, is not a mere believer in the "general principles," but one who has studied it long and ardently, from every source within reach. We repeat, therefore, that it is impossible for the whole human

race to become phrenologists; but that it is desirable to possess a general knowledge of the laws which govern both mind and body—though at present not generally acknowledged—is, on reflection, too obvious to require enforcement.

We have not yet been favoured with the rules of the Warrington Phrenological Society; but we may observe that Mr. HEWETT COTTRELL WATSON, Editor of the *Phrenological Journal*, Mr. NEVILLE WOOD, and other gentlemen known to be warm advocates of Phrenology, have been elected Honorary Corresponding Members. We trust, ere long, to be able to report the proceedings of the Institution.—ED.

Crambus aridellus.—In the Linnæan Cabinet is a specimen named *C. rosella* (var. of *C. lutulus?*), which is, I think, the same as Mr. BENTLEY'S. Mr. STONE took it on the ceiling of a house at Darenth Wood, Kent, July 6, many years since.—J. C. DALE, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

NIDIFICATION OF THE MARTIN SWALLOW (*Hirundo urbica*, LINN.)—During the past summer I observed at Thetford rather a singular deviation from the general economy of the Martin. A pair of these birds, instead of building their usual nest of mud, which SHAKSPEARE has so characteristically described in *Macbeth*, occupied a hole in the cornice that ran under the eaves of a house. At no great distance a pair of Swifts occupied a similar situation. The Martin is there by no means numerous, and but very few nests are to be seen in that town. Its congener the Sand Martin, on the contrary, is very abundant; several hundreds of pairs may be seen occupying the different chalk-pits, piercing the low sandy portions of the strata with their numerous perforations.—J. D. SALMON, *Godalming, Surrey, Dec.* 23, 1837.

SCARCITY OF THE MERLIN FALCON (*Falco æsalon*) NEAR SCARBOROUGH.—This bird is here equally scarce with the Hobby Falcon. The Scarborough Museum contains one specimen; and another was shot near Belle-vue on the 19th of last May.—PATRICK HAWKRIDGE, *Scarborough, Aug.* 7, 1837.

Pontia callidice.—When I was at Cambridge, at the meeting of the British Association, Mr. POWER, of Clare Hall, showed me a specimen of *Pontia callidice* (♂?), a variety of the one I had from Dr. ABBOTT, which was ticketed *P. glacialis*, 1844. Mr. POWER said his specimen was given to him by his uncle, and that is all he knows about it.—J. C. DALE, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

A SPECIES OF *Calosoma* TAKEN IN DEVONSHIRE.—I had a *Calosoma* from the late Dr. TUCKER, which was in his cabinet as *C. inquisitor*, but it is quite distinct, although unnoticed by the late Dr. LEACH, who frequently saw Dr. TUCKER'S collection. It was probably taken at Tavistock or Ashburton, Devonshire.—*Id.*

THE DALMATIAN KINGLET (*Regulus modestus*, GOULD).—Mr. GOULD ob-

serves, in the twelfth part of his *Birds of Europe*,—" A single specimen of this interesting little bird has been sent us by the Baron De Feldegg, of Frankfort, to whom our acknowledgments are due, not only for this instance of his liberality in consigning to our care, at the risk of loss and injury, a bird probably unique in the collections of Europe, but for many similar instances of disinterested generosity.—The only history of this bird which we have been able to collect, was that written on the label attached to it by the gentleman above-mentioned, and is as follows :—'I shot this bird, which on dissection proved to be a male, in Dalmatia, in the year 1829.' Its most conspicuous characters are the three yellow stripes which ornament the head; the brighter and most highly-coloured of these marks, contrary to what obtains in any of the other *Reguli*, being that over each eye, while the coronal stripe is palest, and consists of feathers similar in length to those which cover the rest of the head." The same bird is, very judiciously, figured in two different attitudes, "to exhibit more clearly its characters and colouring." The lower figure is a perfect gem.—*Analyst for January*, 1838, *No.* xxii., *Vol. VII.*, *p.* 261.

Importance of Phrenology to Naturalists.—We conceive that Comparative (or Animal) Phrenology ought to enter into the plan of every zoological periodical; for surely the mental characteristics of animals, as indicated by their habits and organization, must afford a subject of study to a philosophical naturalist at least equally interesting as is an examination of the various colours in the feathers of birds, or the shape and size of their toes and bills; or an enumeration of the number of teeth in the jaws, or bones in the tails of quadrupeds. But whatever interest Animal Phrenology might afford to philosophical naturalists, the fact is that zoologists pay no attention to it as yet; and the *Magazine of Zoology*, as far as we remember, has never alluded to the subject. Still, the phrenological gleaner may occasionally find a few grains of corn for himself, and we have introduced this slight notice of the work for the purpose of presenting one of these grains to our own readers, as a striking illustration of the influence of external circumstances in modifying the habits of animals. Every boy in England is aware of the shyness or timidity of the persecuted Magpie; indeed, so great is the caution of these birds in some districts, that an inexpert marksman finds it difficult to approach within his own gunshot distance of them; yet we have only to cross a narrow sea, for the opportunity of studying the character of the Magpie in a totally opposite condition with respect to timidity; and we should be glad if any of our ornithological friends could compare the skulls of English and Norwegian Magpies, so as to ascertain whether the difference of habit is not accompanied by some difference in cranial configuration. In an article on the Ornithology of Norway, in the number of the Magazine above-mentioned, Mr. Hewitson thus speaks of this species: " The Magpie is one of the

most abundant, as well as most interesting, of the Norwegian birds,—noted for its sly cunning habits here, its altered demeanour there is the more remarkable. It is upon the most familiar terms with the inhabitants, picking close about the doors, and sometimes walking inside their houses. It abounds in the town of Drontheim, making its nest upon the churches and warehouses. We saw as many as a dozen of them at one time seated upon the grave-stones in the church-yard. Few farm-houses are without several of them breeding under the eaves, their nests supported by the spout. In some trees close to houses, their nests were several feet in depth, the accumulation of years of undisturbed and quiet possession."

Besides affording us an example of the effect of human treatment in developing the instincts of birds, there is a second application of this passage to Phrenology. It will be observed that the writer of the passage alludes to the "sly cunning habits" of the Magpie in this country, and then, by way of contrast, makes a statement in proof of less *timidity* being manifested in Norway, without the slightest mention of any habit evincing less shyness or cunning. It is obvious rom this confounding of two very different feelings—cunning and timidity (Secretiveness and Cautiousness)—that a good ornithologist, accustomed to observe the habits of birds, will blunder in his explanation of them, unless in possession of some analytical key to the mental faculties, such as is afforded by Phrenology [and by it alone.—Ed. *Nat.*]. We are surprised it should not at once have occurred to Mr. Hewitson, that the domestic animal, of all others, most habitually the inmate of our houses, is also the most sly and cunning of our tamed animals: we mean the Cat. We are disposed to believe that the slyness or cunning of the Magpie aids the bird in appreciating the amount of danger, and thus indirectly renders it venturesome where it is safe to venture. The Magpie is an observant bird; and its habits, which are usually denominated cunning or sly, appear to spring from the feeling of Secretiveness combined with intellectual observation—Individuality or Eventuality.—*Phrenological Journal*, *Dec.*, 1838, *No.* liv., *Vol. XI.*, *p.* 67—8.

Sayings and Doings of Skaters.—At this frigid season,—when we trust all such of our readers as are not incapacitated by sickness or other misfortunes—amongst which we shall class *want of leisure*—are enjoying the sports of the ice, we shall be excused for introducing a few observations on that active species of animal known as the *skater*. A thorough-bred skater is the most miserable creature imaginable in a "black frost," or during the infliction of a week's fall of snow; insomuch that none but the initiated would believe that the being now crawling, at Tortoise-pace, through the white mantle overspreading the earth far and wide, could by any possibility quicken his progression. And, probably, no more he could to-day. But on the morrow the thermometer sinks to 14°; then behold him, all activity, on the

smooth extensive ice, leaving his yesterday's host of ridiculing friends to wonder what in the world could have wrought this wonderful change, and rendered the *ci-devant* Tortoise a very *Hare on skates!* He who, but a few hours ago, could scarce prevent his nose from freezing at a temperature of 32°., is now complaining—with the thermometer at 14° in the shade—of the *extreme sultriness of the day*, and after vainly seeking a *refreshing zephyr* in some sheltered nook, throws himself down upon the first accommodation that meets his view. It is truly surprising to witness the zeal which actuates individuals of all classes on the ice. Men otherwise considered lazy in a physical point of view, will buckle on their skates and glide and twist and whirl away for hours together, with little apparent fatigue. When we consider that such persons scarcely know what it is to feel cold—that is, as long as the ice lasts—while others are shivering beside warm fires, we think every healthy man ought to keep his skates in full employment while he has the opportunity. Regarding the matter of cold, a skating friend of ours having occasion, once upon a time, when the thermometer stood many degrees below the freezing point, to walk several miles, observed that he would postpone his journey till the *cool of the evening!*—We might extend our skating reminiscences almost *ad infinitum;* but, having already occupied more space on the subject than we can well spare, must postpone any further observations we might be disposed to make upon the *physical*, *moral*, and *intellectual* advantages of this recreation to a future opportunity.—Ed.

REVIEWS OF NEW PUBLICATIONS.

Considerations on Modern Theories of Geology; and their Consistency or Inconsistency with the Scriptures. By Thomas Gisborne, M.A., Prebendary of Durham. London: *T. Cadell*, Strand; *W. Blackwood and Sons*, Edinburgh. 1837. 8vo. pp. 61.

We have previously announced the publication of this pamphlet, but have hitherto had no opportunity of reviewing it—a task we shall now briefly discharge.

There are three classes of belief as regards the science of Geology. Firstly, those who abjure it *in toto*, as altogether subversive of the Scriptures; secondly, those who adopt the *facts*, but reject the *theories* of geologists; and thirdly, those who make every thing give way to their geological theories. To these we may add the divines who would cause every geological theory to rest upon scriptural authority, either with or without consulting geological facts. To this latter class we may refer the author of the pamphlet before us, who wishes all theories—if he feels such to be desirable at all—to hinge upon scriptural authority;

but at the same time he does not disdain to consult the facts of Geology. For our own part, we uncompromisingly profess to appertain to a fifth and very small class, namely, that which rests its belief on the test of reason and experience conjoined. Seeing that it is next to impossible implicitly to believe every thing advanced in the Bible—considering the metaphorical language in which much of the Sacred Volume is written, and, above all, the notorious errors of the translators, we would ask, whether it is more rational to place unconditional reliance on every passage of the Bible, or to submit the whole to the severe test of reason? Doubtless mistakes may occur even in this manner—nay more, they *must* happen, since on almost every point there will, in the first instance, be difference of opinion. But the most powerful intellects will, of course, in the long run, "carry the day," and convince their inferiors in intellect—not by dogmatism but by argument—of the rectitude of their views. Men who make it an affair of conscience to believe all that they read in the Bible, because their clerical instructors have ordered them to do so, are either little gifted with reasoning powers, or their education must have lamentably depressed their intellects. Such individuals cannot truly be said to have any belief of their own—since their "articles of faith"—for the holding of which they can assign no sufficient reason—are *forced* upon them, and this inforcement is not the less arbitrary because it falls insensibly upon an individual unconscious of its baneful effects.

Further, although the New Testament forms an inestimable code of morality, assuredly the Old Testament was never intended to teach science to this or any other age. Moses did *not* write to impart Physics, and the Bible is not the book to which any sensible man would repair for even the rudiments of science. Let geologists, if they will, form geological theories from the facts collected by themselves and their brethren; no book can so well assist them in their inquiries as the Book of Nature—the fountain, the pure, inexhaustible source, which can never be consulted without advantage, because it interprets—so far as we can at present understand them—the laws of God as applied to Creation.

Even supposing Mr. Gisborne to have shown the falsity of some of the theories propounded by geologists of eminence—and in some cases we think he has succeeded—that is no reason why we should not indulge in geological speculation in some degree and in a certain manner. If we make no use of the mass of facts collected by observers, we inevitably remain ignorant of some of the most interesting and important circumstances. Rash speculators in Geology ar eas mischievous and as numerous as rash speculators in any other science; but rational theories, deduced from a sufficient number of well-attested facts, in process of time become to be considered undeniable truths; and if, when a mass of testimony so convincing and overwhelming that it converts the veriest sceptic that ever was born, can be adduced to substantiate what was once considered, perhaps not

wholly without justice, a vague speculation, surely the speculative mode of procedure and of investigation, always amply supported by, and based on, well-known truths, will not be discarded as dangerous, but must, on the contrary, by the enlightened and intelligent, be considered as orthodox a process of the mind as direct observation. Doubtless we are intended thus to act to the extent of our ability, and the true philosopher will never rest satisfied with discovering what every one may ascertain for himself, but, soaring immeasurably above the range of ordinary intellects, discovers the laws by which the universe is governed.

Shall we be told that such men, self-conceited and arrogant, despise the Scriptures, lay aside Revelation, or become atheists? We may be answered in the affirmative, and unquestionably some of the most eminent scientific men have been called atheists. But we reject the imputation with scorn. A scientific man may be an atheist, but does it hence follow that his knowledge of science deprived him of his belief in the Deity? Assuredly not; for although an individual so organized as to be incapable of conceiving the existence of an Almighty Governor of the Universe may advance to the first rank in science or literature, yet, to a mind more happily constituted, every additional fact learned or discovered only serves to substantiate his belief in the one only true God, and to raise his thoughts in wonder and admiration to the symmetry and presiding intelligence observable alike in the minutest and apparently most trifling object in Nature and the most sublime ornament of Creation.

We do not mean to say that a belief in God and scientific knowledge by any means *necessarily* go hand in hand, since the latter may be prosecuted in a manner altogether independent of the former; but when they *are* investigated jointly, the one will be found to assist the other to a degree on the outset little calculated.

We object, therefore, both to refusing credence to speculations because they are such, and to undervaluing *all* modern theories; and, with humble and profound reverence for the Scriptures, properly studied, cannot but deprecate the false philosophy of endeavouring to learn science from the Bible, and, above all, the absurd method of remaining satisfied with that source alone, while looking down upon those who advance further, or proceed in a different manner, as atheists and impostors—terms which, while they frequently and generally fail to injure those eminent individuals at whom they are aimed, rebound with tenfold force upon the ignorant multitude ever ready to detract from the justly-earned laurels of their superiors in intellectual, moral, and physical excellence.

Of Mr. Gisborne's pages we have little further to add; but we consider them deserving of perusal, though we would not recommend implicit reliance on any thing but reason, from whatever quarter emanating.

149362

THE NATURALIST.

OBSERVATIONS ON THE POPULARITY OF NATURAL HISTORY.

WITH ILLUSTRATIONS AND SUGGESTIONS.

BY EDWIN LEES, F.L.S.

I FEEL disposed on the present occasion to assume the garb of "Dr. DRYASDUST," and to enter upon a dissertation wherein my opinions may, perhaps, meet with disapproval by some equally competent to form a judgment as myself, rather than to journey on at this moment, amidst scenes tenanted by birds, insects, and flowers, where there could be no jarring string. Good, however, is frequently effected by the disclosures an argument calls forth, just as a fossil unexpectedly appears in a rock one might be breaking-up without such an object in view. If, therefore, I should tempt any abler pen to take up this subject, I shall rejoice, even if my own ideas should appear to be unsustained.

Among the various oracular dicta that in this teeming age of useful and entertaining knowledge have resounded in the public ear, till they have been supposed unassailable truisms, the "popularity" of Natural History has surely appeared not the least prominent. It seems, indeed, almost treasonable to doubt it; but by what test are we to try the truth of this assumed popularity? If I am referred to the various societies formed professedly to promote the study of Natural History, I answer these are assemblages of its *votaries*, formed for the facility of communication with each other, and, the public being excluded, these (were they even more numerous than they are) would be by no means decisive of the universality of the taste for the pursuit in question. If I am referred to the numerous works published on the subject within the last few years, it must be distinctly shown, that all these have remunerated their authors and publishers before I shall feel satisfied that a case has been made out perfectly satisfactory as to the general approval of works of this description by a "discerning public." This point may, perhaps, be discussed hereafter.

But surely I think I hear it exclaimed, the objects embraced by Natural History *must* be "popular"—they are open to every one, the prince and the peasant, and present their charms alike to all. Assuredly! and I admit at once that *the objects* taken up by Natural History *are* popular; the most insensible ploughman puts his hand to his hat for a moment to mark the Lark rising to heaven's gate on the first vernal day—the most rigid votary of 'Change in the pent-up city, snuffs up with delight the scent of the first delicious odour of the

Violet-bed. But the same ploughman would not hesitate to express his surprize if he saw you near the nest of the Lark with any other intention than that of taking it; and the merchant would stare if referred from his ledger to study LINDLEY'S *Natural System of Botany* for the place of the Violet.

It is within my own experience, and I doubt not of almost every *practical naturalist*, whatever branch he may especially favour, that the tables are quite turned as soon as you leave general assertions of the "beauty of Nature," and perhaps interesting facts and anecdotes respecting plants and animals, to touch upon the *scientific* part of the subject. Not a mortal man exists with whom you can by possibility come in contact, but bores you with that eternal theme the state of the weather, its changes and its indications, nay, perhaps the oracular observation has been made that "the *glass* has risen," but attempt to discuss the various forms of cloud, and the minutiæ of those phenomena on which the state of the weather depends, and you soon find all interest subside, and it too soon appears that Meteorology is considered a *dry* subject. If Zoology, Ornithology, Entomology, or Botany, be tested in a similar way with reference to the *general* feeling on the subject, how few will be able to comprehend their *details*, or name scientifically the animal, bird, insect, or plant presented to their inspection. How superficial, then, must be this gold-leaf "popularity" which the slightest rub effaces; for if Natural History were really popular in the proper sense of the term, its *study* would be general, and its terms "familiar as household words."

It becomes necessary then to submit the subject to careful analysis, that all incongruities may be removed, and that it may be clearly perceptible what portion of it really meets the general plaudit, and what rather appertains to the comparative few, and thus perhaps an intermediate path of utility may be descried. I shall therefore propose a division of

I. POPULAR NATURAL HISTORY.

II. SCIENTIFIC NATURAL HISTORY.

In discussing the first, I must premise that I mean it to include a description of, or reference to those objects of Nature which meet the universal eye, and of course must obviously more or less be within the observation of every one, in language which requires no glossary to unlock its meaning. I shall subdivide it into

I. DESCRIPTIVE.

II. SYMBOLICAL.

The description of natural objects in easy but correct language, familiar, yet not vulgar, must ever give delight to mankind in general, because it appeals to their best and happiest feelings, and as it refers to past pleasant things, so it points out a vista to what may occur again—it holds forth objects perhaps before only cursorily examined, and gives an impulse to their re-examination at the

next opportunity. A skilful author who seeks to charm the world, will take every opportunity of thus introducing sketches of and references to scenes familiar to his readers, even if they occasionally digress a little from the main purport of his treatise, because, like an inequality in the bed of a stream, if the current be momentarily impeded, additional beauty is created by the rough mossy stones round and over which the chafed waters urge their way with musical reverberations. No one ever understood this better than good ISAAC WALTON, who, if he had clung closely to his hook and line, might have been forgotten long ere this, except by the craft, and would surely never have passed through the varied editions he has done. Let us snatch a quotation from him:—" My friend PISCATOR, you have kept time with my thoughts, for *the sun is just rising*, and I myself just now come down to this place, and the Dogs have just now put down an Otter. *Look down at the bottom of the hill there in that meadow chequered with Water-lilies and Lady-smocks*, there you may see what work they make: look, look, you may see all busy, men and dogs, dogs and men, all busy."* Now the charm of this allusion is the sun rising on a glorious summer's morn, with the brook winding in the meadow at the bottom of the hill, its margin covered with silver Cuckoo-flowers, and the Water-lilies spreading their broad leaves on its verge. This is the picture which WALTON has animated with an Otter-hunt, although the taking of an Otter might have been described to the initiated in a very different manner.

Again, he remarks—" Look, *under that broad Beech-tree* I sat down, when I was last this way a-fishing, and the birds in the adjoining grove seemed to have a friendly contention with *an echo,* whose dead voice seemed to live *in a hollow tree*, near to the brow of that *Primrose-hill*." Who is not charmed with such a reference as this, to which, however, angling, though the main subject of the book, is rendered quite subordinate? The reason is, that *any body* may go when time allows and sit under the broad Beech, and hear the birds, and mark the echo in the hollow tree, and the Primrose hill, whether they choose to be anglers or not. If inclined for a meditative day, they may so far follow old ISAAK as to " go to yonder Sycamore-tree," hide their bottle of drink under the hollow root of it, and " make a brave breakfast with a piece of powdered beef," without any positive necessity of using rod and line, unless they prefer it.

These general illustrations are the charm of Poetry, which would be utterly insipid without them, and even when they appear locally particularized, if skilfully managed they become gems of the purest water in the bardic chaplet. Take this from WORDSWORTH—

* WALTON'S *Angler, in loc.*

——"Beside the cottage in which Ellen dwelt
Stands *a tall Ash-tree*; to whose *topmost twig*
A thrush resorts, and annually chants,
At morn and evening, from that naked perch,
While all the undergrove is thick with leaves,
A time beguiling ditty, for delight
Of his fond partner, *silent in the nest*."*

Bards in general take but a low rank among naturalists, although the latter are indebted to them for many an illustration; but surely the above is a sweet morsel of local Natural History, recorded by an evident observer and lover of Nature, and though having reference to a particular Thrush and Ash-tree, yet it interests all, because, to say nothing of Ellen, few persons familiar with the country are unacquainted with Thrushes resorting, like that of the poet, to some old tree's "topmost twig."

Many an observer of Nature, competent to the task, has probably never thought of presenting himself as a professed naturalist, but if his delineation be correct, it is evident that he understands that truly popular language which captivates all hearts by its adaptation to the subject depicted, and which is not the less interesting because it is comprehended by all, and recognized by all who have an opportunity to make the comparison. I scarcely think the manners of that pert braggadocio of the farm-yard, the Common Goose, has been better pourtrayed in any professedly ornithological work, than in the following lines of poor almost-forgotten Bloomfield—

"He comes, the pest and terror of the yard,
His full-fledg'd progeny's imperious guard;
The *gander;* spiteful, insolent, and bold,
At the colt's fetlock takes his daring hold:
There, Serpent-like, escapes a dreadful blow,
And straight attacks a poor defenceless Cow.
Each booby Goose th' unworthy strife enjoys,
And hails his prowess with redoubled noise.
Then back he stalks, of self-importance full,
Seizes the shaggy foretop of the bull,
Till whirled aloft he falls; a timely check
Enough to dislocate his worthless neck:
For lo! of old, he boasts an honoured wound.
—Behold that broken wing that trails the ground."

The following quotations from the same author's "Farmer's Boy," describe two forms of cloud that have received peculiar appellations from scientific meteorologists, which I dare say Bloomfield never knew of, though his appropriate

* *Poetical Works*, Vol. V., p. 260.

description renders it impossible to mistake them, and is indeed so just as to be referred to in scientific works.

THE CUMULO-STRATUS.

"Now eve o'erhangs the western cloud's thick brow;
The far-stretch'd curtain of retiring light,
With fiery treasures fraught; that on the sight
Flash from *its bulging sides*, where darkness lours,
In fancy's eye *a chain of mouldering towers;*
Or craggy coasts just rising into view,
Midst jav'lins dire, and darts of streaming blue."

The poet describes "the slow-winged storm along the troubled skies," as following this aspect of the cumulo-stratus, and in a scientific enumeration of clouds now before me, it is observed of this modification of cloud, that "long ranges often seem to rest upon our hills, where they generally indicate *a change of weather.*"

THE CIRROCUMULUS, OR SONDER-CLOUD.

———————"The white-rob'd clouds in clusters driv'n,
And all the glorious pageantry of heaven.
* * * * * * *
Far yet above these wafted clouds are seen
(In a remoter sky still more serene,)
Others, *detach'd, in ranges through the air,*
Spotless as snow, and *countless as they're fair;*
Scatter'd immensely wide from east to west,
The beauteous *semblance of a flock at rest.*"

Perhaps a better description could not be given of this lovely form of cloud, so often the accompaniment of a fine night, when the moon sails majestically along in the azure heavens, surrounded and followed by milk-white squadrons of these innumerable guards.

I have purposely selected the preceding examples as being plain yet admirable descriptions, unattended (I will not say unincumbered) by any sentimentality, with which poets often mix up—as they have a right to do—their descriptions of, and allusions to, natural objects and scenery, thus giving distaste to many well-meaning, but somewhat squeamish persons. I shall, however, before closing this part of my subject, give a specimen of a somewhat more ornate style, which indeed is not to be objected to, provided the boundaries of truth and probability are not infringed upon. As this style of description bears the character of a study, though pleasing to many, it should be entered upon with caution. The following extract is from CHATEAUBRIAND'S *Genius of Christianity.*

"The Bullfinch builds in the Hawthorn, the Gooseberry, and other bushes of our gardens; her eggs are slate-coloured, like the plumage of her back. We recollect having once found one of these nests in a Rose-bush; it resembled a shell

of mother-of-pearl, containing four blue gems; *a Rose, bathed in the dews of morning, was suspended above it;* the male Bullfinch sat motionless on a neighbouring shrub, *like a flower of purple and crimson.* These objects were reflected in the water of a stream, together with the shade of an aged Walnut-tree, which served as a back-ground to the scene, and behind which appeared the ruddy tints of Aurora. In this little picture the Almighty conveyed to us an idea of the graces with which he has decked all Nature."

Though perhaps, in this finished sketch, it is a little stretch of imagination to compare our sprightly "Hedge Coalhood" to *a flower*, yet as a double picture is exhibited in it, and either is charming taken alone, the pleasing exhibition may almost excuse it. For, independently of the Bullfinch, the old Walnut-tree reflected in the stream, with the vermillion tinges of the eastern sky, seen through its foliage, is itself a picture, and the Bullfinch's nest and eggs in the Rose-bush is an object by itself requiring no adventitious aid to heighten its beauty.

It will now perhaps be perceived that popular Natural History is nothing more than a description of natural objects so true to Nature that every one admits the resemblance, being either tested by his own experience or by that of others, and the information at the same time conveyed in that *non-technical language* which may be understood by every person of plain education, although unskilled in and unacquainted with the myriological vocabulary of scientific formulæ. I have no wish to disparage scientific nomenclature when restricted to legitimate bounds, but in an appeal to facts it would be absurd to blink] altogether the question of phraseology. Scientific names can only be understood by scientific persons, and it follows as a matter of course that a book that can be interpreted only by the initiated, will have but a limited range of readers. This ought to be considered by those authors and editors of periodicals who, as in the *Entomological Magazine*, indulge at times in such legions of latin, as I fear to render it unnecessary to cut-up much of their hot-pressed paper. It is true that certain subjects, limited in their range, or intended for the learned of all countries, may with the utmost propriety appear in a latin dress, but surely an English periodical is not the place for them, if that periodical seeks an extensive circulation. By parity of reasoning, any work on Natural History aiming to be read by the public at large, must to some extent be written on the principle of what I have shown popular Natural History to consist. There are two especial reasons for this; a work overloaded with technicalities is uninteresting, and very few will toil through a work void of interest. The next point is an important one, though for the most part lost sight of—the newspaper press of this country is almost wholly ignorant of Natural History, at all events unacquainted with its details, and hence unable to interpret common occurrences and common appearances without the assistance of a practised observer. The

greatest mistakes are therefore often made by these vehicles; they give publicity to mysterious accounts and seeming wonders that are of no authority, and do not occupy, as they might do, that position between the scientific publication and the unlearned observer which would be of the utmost importance to the spread of a correct taste for Natural History. They may indeed admit a statement as curious, but, being unable to give the explanation, they resemble an author I have met with, who, in his catalogue of birds found in a certain spot, mentions some Gulls seen flying occasionally about a pool, but remarks, to what tribe of that numerous family they belonged, he "was not prepared to say"! Till this be remedied, if the field of Natural History is to be *enlarged*, and its *students increased*, the writers on this subject who address the public through the press, especially in periodicals, are not to suppose their readers in general to be *proficients*, but *learners*. The question then will be, is it expedient to address learners? and I repeat it is so if we wish the boundaries of our favourite pursuit to be extended; and it follows that the language and allusions we make use of should be such as even learners may comprehend and take an interest in.

I have felt it necessary to enter largely upon this topic, because nothing runs more glibly over the tongue than the "*popularity*" of Natural History—nobody disputes it—nobody analyzes the materials of which this cobweb "popularity" is made, and then when we find ourselves laughed at for *devotion to the study*, and perhaps the lucubrations of ourselves or some of our friends not honoured with quite such a premium as falls to the lot of the successful novelist, it does seem a little queer to hear the eternal chorus of the *popularity* of Natural History, from individuals who perhaps scarcely ever open a scientific work on the subject, and whom no inducement could persuade to walk half a dozen miles for any other purpose than to sit down and carouse for the rest of the day! But how can Natural History be *popular* as a *study* yet? It must be imbibed young, if much progress is to be made, and ought to have competent teachers, like any other branch of education. But there is still a prejudice against this in some quarters as unnecessary, and in most instances (the medical profession perhaps excepted), if the men of the present generation know anything about it they have *taught themselves*. When I went to school I recollect the only class-book from which there was the slightest chance of obtaining the rudest rudiments of Natural History, was TURNER'S *Arts and Sciences*, probably obsolete now, in which the whole tribe of heathen gods and goddesses were stowed like goods in a crowded vessel, in company with metals, mermaids, falling stars, thunder and lightning, Lions, and spouting Whales, and cuts of Nightingales and Cuckoos as like the birds they *represented* as some I have seen on old glazed tiles and painted windows, which might pass for any thing. No doubt things are improved now: at any rate *books* are not deficient, but multitudes still exist who have been

educated under the old system, and how then can the *study* of Natural History be *correctly appreciated* yet? how can it be truly popular at *present?*

I have alluded to these things that naturalists may not be deceived,—much, very much, remains to be done before Natural History *as a science* is popular, and this ought to be known and acted upon. This really concerns both the readers of, and the writers in, *The Naturalist.* As a child who has learned to walk disdains the leading strings, so the proficient in science is anxious to proclaim his acquirements. But if he gets on so far as to be *out of hearing*, he can only address the echoes, and perhaps he had better pause a moment for his compatriots to get up. To speak plainly, writers must not yet become so obscure as to be understood only by the learned, and readers ought to consider that if new facts and discoveries and abstruse dissertations are *their* delight, there are others who must be charmed into the path of science by pictures assimilated to their less soaring ideas, and by language which will not be to them an undeciphered hieroglyphic. Sir JAMES SMITH complained that SOWERBY's beautiful plates of British plants made *empirical* botanists, as persons turned over the plates to compare with the plant they had found, and neglected the correct method of consulting the generic and specific descriptions.* This might be so, for there will always be lazy fellows in the world ready to pounce upon knowledge in the easiest way; but Sir JAMES should have considered that science was surely benefitted, because, as his descriptions were *purchased with the plates*, they could not well be got rid of, while in all probability he who commenced with the plates, examined the descriptions at last. So it is in literature,—a man opening a work for *amusement*, shrinks from a catalogue of names that seems to present an awful appearance to his eye, and looks for a lighter article, and yet probably that lighter article may, when his attention is once excited, lead him to study and duly appreciate the once abandoned and formidable catalogue of unknown names.

The enquiry I have broached ought to claim the attention of Natural History Societies. Many of these have arisen with bright prospects within the last five or six years. Some have gone to the tomb of the Capulets—others have flourished—a few perhaps maintain a precarious existence. None have, I think, done what might have been expected from them. They perhaps trust to the "popularity of Natural History." Vain delusion! it is their duty to make Natural History popular. What steps have they taken to do this? Have they encouraged its votaries? Invited its friends to state their views to its members? Opened communications with men of science throughout the kingdom? Given every encouragement personally and unitedly to publications illustrative of the subject they profess to appreciate? Have they published synopses of the

* Preface to his *English Flora.*

productions of their counties, and opened museums at least at stated times *to the public?* for I scarcely recognize the public spirit that admits *members only*, or demands a fee for what ought to be open for general benefit. I contend that a museum open only to certain persons, or on payment of a fee, is in effect a private museum, and will never advance the *popularity* of Natural History. There is another point—it often happens that votaries of Natural History, men born with the *spirit for the pursuit glowing within them*, are poor, nay, occasionally in very subordinate situations.—I have known many clever fellows in their way, so situated. Now are these sought out, and brought to bear as they ought to be, or at any rate admitted gratuitously to the society in return for their ready talent and manipulations? This ought to be, if good is to be effected of a permanent character. The lectures, too, given under the auspices of Natural History Societies—and *all ought to have lectures*—should be of a popular character, to excite attention—engage interest—and awaken thought on the various phenomena of Nature. Mere professional lectures are ill suited to a mixed audience, and sometimes alarm and disgust. Occasionally, also lectures *free to the public* should be given.

I wish to awaken attention on the subject of this paper, and if my remarks should be deemed worth consideration, I will at the first convenient opportunity resume them.

Dryadville Cottage, near Worcester,
January 15, 1838.

ACCOUNT OF THE SOIREES AT THE LIVERPOOL ROYAL INSTITUTION.

By Mr. T. B. Hall.

I send you the following account of two Soirées or Conversazioni, which have been held at the Royal Institution in Liverpool; it may perhaps be interesting to some of your readers, and may serve as a model for similar ones that might prove successful in various towns, wherever there is a museum or rooms suitable for the purpose. They are part of a series which it is proposed to give during the present winter, and to continue in succeeding winters if they should be found to be acceptable to the public. They are under the management of a sub-committee of the proprietors of the Royal Institution, and a sub-committee of the Literary and Philosophical Society. Their motives for giving them are to extend the taste for science, literature, and the arts; and to impart more fully their influence to society; they therefore think it desirable to afford to the inhabitants of Liverpool

and the neighbourhood opportunities of meeting and enjoying conversational discussion of such subjects, whereby information may be afforded to the lovers of those pursuits, without the formality of professional displays of science, and which may lead to deeper research into more perfect sources of scientific information, and to the cultivation of a purer taste; and they request that every subscriber possessing any articles of interest or curiosity, calculated to illustrate or to have reference to such a subject, will suffer them to be placed in the Institution for that evening, for the purpose of adding to the amusement and gratification of the company.

The first Soirée was held on the 29th of November last, and the number of tickets issued was 277 for gentlemen, 214 for ladies, and 27 for strangers, it being the intention of the sub-committees not to exceed 500.

The rooms and museum were thrown open at seven o'clock, and at eight such of the company as were desirous adjourned to the lecture-room. J. B. Yates, Esq., president for the evening, in a very able address, explained to the meeting the object of the Soirées, and expressed his sincere wishes for their success. William Wallace Currie, Esq., then read an unpublished essay on the advantages of a cultivation of the polite arts, by the late William Roscoe, a very able and eloquent paper, written at an early age, and containing the germ of that immortal essay which was delivered (exactly twenty years from that period) at the opening of the Institution. It negatived the usual opinion that Man can only reach perfection in one science, and its author was indeed a proof to the contrary, as he excelled in Poetry, Painting, Botany, and general Literature. After the discussion to which the paper gave rise, the company adjourned to the rooms of the museum, tea and coffee were supplied, and the remainder of the evening was passed in conversation and in the inspection of the museum and galleries of the Institution.

The Institution was originally erected at an expense of £23,000. It remained for some time in a state of suspended animation, exciting no interest in the public mind, and from the want of arrangement, the difficulty of access, and the incompleteness of its collections, deserving to excite none. All these faults, however, have lately been amended; it has been popularized, and rendered easy of access, its collections have been greatly enlarged, and arranged with taste and correctness. A detailed account of the objects would only prove tedious to your readers, but an outline of them may, perhaps, not be altogether uninteresting. I will therefore state that they consist of—

Numerous specimens of Natural History in its different branches.

A selection of valuable philosophical instruments.

Specimens of the rude ingenuity and illustrations of the habits and customs of distant countries.

An extensive and unique gallery of casts from the antique, showing the progress of Sculpture, from the earliest ages to those of the most refined period of the art.

A series of curious and interesting specimens of the works of the earliest Italian painters.

Etruscan, Egyptian, and other antiquities.

Amongst various specimens in Natural History and the Fine Arts that were placed in the Institution for the gratification of the company, were the following rare plants :—*Sinningia guttata*, *Ceroptopteris thalictroides*, *Euphorbia pulcherrima*, *Aerostichum alcicorne*, *Cereus senilis*, *Zygopetalum Mackai*, *Epidendrum fragrans*, belonging to C. S. Parker, Esq.; several parts of Bateman's *Orchidaceæ*, and Professor Agassiz' admirable work on fossil fish, belonging to the same gentleman; and many valuable paintings, the property of Thomas Winstanley, Esq.

In the course of the evening Mr. R. Adie exhibited a differential hydrometer for measuring the rate of the sailing of vessels. It is derived from the differential barometer of the late Dr. Wollaston. The measure of the current of water is the buoyant force of a column of oil, immersed below the level of the water in the arm of a glass tube bent nearly double, one half filled with oil and the other half with water.

The second Soirée was held on the 10th of January. Owing to the disappointment experienced by parties at the last meeting, in not being able to obtain tickets, and the success which attended it, the sub-committees deemed it expedient to issue 100 additional tickets.

J. N. Walker, Esq., president for the evening, introduced Dr. Sutherland, who read a very interesting paper on the connexion between the geological structure of a country and its natural scenery; it was originally delivered at the December meeting of our Natural History Society, and seemed to give great satisfaction.

They were remarks made during a tour in Switzerland and part of Italy, and a portion of his remarks applied to England. The following is an extract, which, if you think proper, you can insert :—Where soft rocks exist, the mountains assume a rounded appearance. The insinuation of water between masses of rocks, and the effects of cold on it afterwards, exercise so powerful a degree of force as to dissever large masses of rock, which cause their downfall and considerably affect the general outline of the landscape. The first or primitive formation comprehends granite, and is the lowest in the series, but by volcanic and other powerful agents it becomes broken-up and raised above the surface; some of the highest mountains in Europe are of this formation. They are characterised by

their angles and perpendicular precipices, which have a marked smoothness and nakedness; many examples of this kind were to be seen in the Alps. The breaking off of large portions of granite rock was sometimes followed by dangerous results, in overturning into ruins, and burying all that opposed them, like a falling avalanche. The scenery of Mont Blanc was described to us in a most vivid and eloquent manner. The secondary formation included a vast variety of scenery; it presented to us what is commonly called landscape scenery, and the romantic; boundless plains, mountains, and lovely fruitful vallies. Limestone surface presented a great variety of surface; the colour varies very much, sometimes being of a bluish cast, and the mountains are generally conical, the scenery of Berne affording the finest specimens of it. The Sandstone had a very extensive range in England; it was generally distinguished by flowing hills and fertile vallies, as the beautiful vale of Wharfedale, in Yorkshire. Alluvian formations ought to be considered rather as a covering to others than as a distinct class; the most remarkable specimen of this kind of surface was seen in the plains of Lombardy, and their fertility was well known. The Basalt formations of the Giants' Causeway, and the peculiar construction of Basaltic rock pillars, was alluded to, and the volcanic formation was slightly touched upon. The whole country round Rome was flat and barren, with occasional hills, the result of volcanic action, and in the bottoms of extinct craters several lakes occurred.

The south coast of Italy also afforded striking evidence of subterranean action, appearing as if shaken into fragments. The paper was illustrated by a series of paintings of different scenery, and of chalk drawings, prepared for the occasion by one of the pupils of the Institution schools.

We had a great many fresh paintings and works deposited for the amusement and gratification of the company, principally relating to Ornithology. Amongst them were Selby's *Illustrations of British Birds*, Gould's *Birds of Europe*, Gould's *Century of Himalayan Birds*, and some fine engravings of the plants of Coromandel.

Mr. R. Adie attempted to perform some experiments with the large plate electrical machine belonging to the Institution, but the evening was unfavourable for it, and he exhibited to the company the action of a powerful electro-magnetic apparatus.

Woodside, near Liverpool,
Jan. 16, 1838.

ON THE MIGRATION OF BIRDS.

By Peter Rylands, Esq.

If there were nothing else to lead me to esteem *The Naturalist* higher than the other Magazines devoted to the same sciences, the attention paid in its pages to Comparative Phrenology would be sufficient (see p. 110). Being a subject of great importance to all zoologists, its neglect by the other Natural History periodicals manifests either a total ignorance of, or wilful inattention to it, on the part of the Editors, which cannot be too severely condemned.

The investigation of the mental constitution of the lower animals is highly interesting and instructive, and cannot, surely, be deemed irrelevant in our observations of their actions. Phrenology throws a light upon this inquiry which all naturalists would do well to profit by.

It is evident, when we carefully observe the actions of animals, that they result from certain propensities, or inclinations, similar in kind to, although from various causes their manifestations differ from, those of Man. The action of the propensities in Man is considerably modified by his possession of moral and intellectual organs; the former being entirely absent, and the latter very slightly developed in the lower animals. Two men having the same inclination will gratify it in different manners, owing to the influence of the organs just mentioned. While, on the contrary, each species of animal having definite propensities —without this modifying influence—all the individuals of such species will manifest their desires, in most cases, in exactly similar modes of action. This constitutes only an apparent, and not a real difference between the two. In both cases the primitive feeling is *essentially* the same. Philosophers, however, misled by this appearance of distinctness, have separated them, giving to one the appellation of *reason*, and to the other that of *instinct*. Here allow me to enter my protest against the use of this term "instinct." Associated with it, in most instances, are very erroneous and contradictory ideas. The unanimity shewn by authors in the adoption of it cannot be an argument for its continued use. An examination of their works will prove that each has given to it a distinct meaning of his own, and that most have made it a cloak for their ignorance of the nature of the phenomena which it denoted. In fact, from the use which has been made of it, the term "instinct" is now rendered useless. And if perspicuity of language, or definiteness of argument be desired, it ought to be at once abandoned by all.

When we consider that Phrenology demonstrates that the propensities of the lower animals are the same as those of man—that it also points out the organs of these propensities—its importance in discussing the cause of the migration of

animals, as well as that of any other of their actions, will be clearly perceived. Indeed, without the aid of this science, the wisest metaphysician or most experienced naturalist would alike fail in giving a probable solution. Three points respecting migration of birds deserve our attention: 1st, the propensity which prompts it; 2nd, the periodical excitement of the propensity; and 3rdly, the power which directs them in their flight.

1. *The Propensity.*—Phrenology teaches us that there is an organ in Man which takes cognizance of the relative position of objects, remembers places, and gives the *desire to travel.* It is evidently this last impulse which is the cause of migration. Phrenologists have named the organ *Locality,* and if the faculty they have given to it be the correct one, we may reasonably expect to find it fully developed in migratory birds. This is actually the case. I have at present before me several crania of birds, and in the migratory species this organ is evidently larger than in those that stay with us throughout the year. Dr. Vimont, after the examination of several hundred skulls of quadrupeds and birds, states that, in all those that migrate, the organ of *Locality* is found "forming a projection below the crest of the coronal bone, which joins the orbital angle."*

2. *The Periodical Excitement of the Organ.*—Dr. Bushnan states that the propensity to migration is excited only by a failure of food, and the change of temperature. As a proof of the correctness of his opinion, he mentions the following "*curious fact, recorded some years ago.*" "In the neighbourhood of the Carron Iron Works," remarks the Doctor, "where the temperature of the air, to a considerable extent around, must be very much above that natural to the climate, Swallows *are said* to remain the whole winter."† If Dr. Bushnan could satisfactorily demonstrate the truth of this statement, his position would indeed be established. Until then he ought to remember that "*It is said,*" or "*They say,*" although wonderful authorities in daily conversation, lose all their importance when used with respect to matters of science. But the Doctor has yet another proof, which, he informs us, "puts the question beyond a doubt." This is the experiment of Mr. Pearson, as detailed by Bewick.‡ On perusing the account, we find that Mr. Pearson, with considerable care and trouble, was able to keep several Swallows alive throughout winter. This is all. And this *all*, it is scarcely necessary to state, proves nothing in the present question. I think that after the repeated and uniform experience of naturalists, who have

* Broussais' *Lectures on Phrenology.—Lancet* (1835-6), Vol. I. p. 852.

† *The Philosophy of Reason and Instinct,* by Dr. Bushnan, p. 171,—A work containing much interesting matter, but nothing to merit the title the Doctor has chosen to bestow upon it. It is very neatly reviewed in the *Phrenological Journal* for December, 1837, No. i., New Series.

‡ Bewick's *Birds* (Edit. 1832.), Vol. I., 300.

confined migratory birds during the winter, we may safely believe that Mr. Pearson's Swallows manifested, at the usual time, a strong migratory feeling. This, probably, was either unnoticed, not understood, or thought unworthy of record, by the experimentalist. The want of ability to gratify a desire does not prove that such a desire is not felt. Yet on Dr. Bushnan's grounds we must believe, that because the Swallows *could not* migrate, they had no inclination to do so. He might as plausibly contend, that a man after a three-days' fast would have no sensations of hunger, if he were unable to procure food.

As the excitement of the organ of Locality occurs in birds kept in cages in a warm temperature, and abundantly supplied with food, another class of naturalists are of opinion that coldness and scarcity of provision have no influence whatever in producing periodical migration.

Both these extreme opinions appear to be erroneous. I am inclined to believe that, at first, the coldness of climate, and want of nourishment, were the only causes of migration, but that now, this habit, continued through so many generations, has such an influence over the species, that the involuntary excitement of the organ, at stated periods, *must exist*, although the want of food, or change of temperature, is not felt. I have no doubt, however, that these still continue to add a great stimulus to the excitement.* Nor is this explanation improbable. In fact, that peculiar habits, &c., of men are transmitted to their offspring, is so well known, that it is unnecessary to enforce it here. The same influence is found also in the animal kingdom. "Abilities," remarks Mr. Jesse, "which have been kept up by practice throughout several generations, may finally be propagated as natural propensities. I had a young Pointer which found, and pointed at game, the first time he was taken into a field. The descendants of a breed of Terriers, which I have had many years, shew their teeth, and put out their paw when they are caressed. This is a peculiarity of the breed. Young South Sea Islanders are said to be able to swim when first put into the water."†

* We are disposed to take a different view of the case, believing, as we do, that all migratory birds must ever have possessed the organ of Locality—and likewise every other faculty—in the same degree that they now possess it; and that, without the innate feeling which now induces birds to travel, no individual species would ever have quitted its native country, to which it is naturally wedded by other equally innate powers. This argument is supported by the fact that the lower animals, like Man, so long as they remain in a wild and savage state, continue unaltered in their habits. The feeling of hunger or of cold would only impel the animal to seek food, and would not teach it that by crossing the seas sustenance might be procured. Thus although, by adverse winds or other accidents, single individuals may occasionally be cast on strange shores (an occurrence which has, of late years especially, considerably increased the British Fauna), the laws which govern migration are found to be fixed. That birds were originally, and still are, impelled to migrate by the innate faculty of Locality is, therefore, tolerably certain, though the feeling which directs their course is not quite so obvious.—Ed.

† Jesse's *Gleanings in Natural History*, 3d Series, p. 149.

Dr. Bushnan makes a similar observation. "It is certain," says he, "that acquired qualities, however little it may be the case amongst men, are transferred to the offspring among the lower animals, and that in no slight or unequivocal degree." Amongst several others he gives the following fact as corroborating his opinion. "In some parts of America it is the practice to hunt herds of a species of Deer with trained packs of Dogs; the Dogs are taught to attack the herd in line, and by this method never fail to be successful; but if any of the Dogs be led by excessive ardour to break into the herd singly, they are sure to be completely destroyed. This uniformly happens to untrained Dogs, whatever be their strength or courage. But the offspring of Dogs which have been fully trained to this kind of warfare, require no education, but at once fall into the only kind of attack which can be attended not only with success, but their own personal safety."*

3. *The power which guides birds during their migratory flights.*—Dr. Gall mentions several instances of Dogs returning to their homes from a great distance, without the possibility of their having been guided by smell or sight. "A Dog," says he, "was carried in a coach from Vienna to St. Petersburgh, and at the end of six months returned to his native city. Another Dog was sent from Lyons to Marseilles, where he was embarked for Naples, and he found his way back by land to Lyons."† The anecdote, given by Kirby and Spense,‡ of an Ass returning two hundred miles to a place whence it had been shipped, is so well known, and has been quoted so often, that I need not repeat it here. Mr. Jesse states that a Tortoise which had been taken on the Island of Ascension, by the sailors of a ship on its passage to England, was, on their arrival in the Channel, thrown overboard. This Tortoise had only three fins, and was marked in the usual way by having certain initials and numbers burnt upon its under shell with a hot iron, which marks are known never to be obliterated. Two years after its being cast into the Channel, this very Tortoise (easily recognised by the peculiar marks above mentioned) was again taken at its old haunt on the Island of Ascension. Mr. Jesse adds that the proofs brought forward of the accuracy of this anecdote place its authenticity beyond a doubt.|| Many other anecdotes of a similar nature might be given, but these are sufficient. Dr. Gall believes that the power which directs animals, in circumstances such as the above, belongs to the organ of Locality. Mr. Combe is likewise of the same opinion.¶ It is evidently the same power which guides birds during their migration.

Bewsey House, Warrington,
Dec. 23, 1837.

* Bushnan's *Philosophy of Instinct and Reason*, pp. 170, 171.
† Combe's *System of Phrenology* (4th Edit.), Vol. II., p. 507.
‡ *Introduction to Entomology*, p. 496. Jesse's *Gleanings in Natural History*, 1st Series, p. 198.
|| Jesse's *Gleanings*, 3rd Series, p. 77. ¶ Combe's *System*, Vol. II., p. 509.

ON THE NATURE, VARIETIES, AND DEVELOPMENT OF TEETH IN THE CLASS MAMMALIA.

By Beverley R. Morris, Esq.

The meaning of the term tooth being so very generally known, I need not, I imagine, give any precise definition of it here: it will be enough to state, that the term tooth is usually understood to apply to such bones as are naked, and placed, partially at any rate, within the cavity of the mouth. This is sufficiently accurate for my purpose, though I am aware that there are deviations from this rule in some of the lower classes; with these, however, I have nothing at present to do. Teeth in general have only two substances entering into their composition, viz., bone sometimes called ivory, and enamel; some, however (as the Graminivorous animals), have a third ingredient, called *crusta petrosa*, which I shall consider hereafter. I shall not enter into the details of their chemical composition, as I consider that would be a subject more properly discussed in a treatise on Animal Chemistry.

Teeth are formed, not like other bones, on cartilaginous masses, but are the secretions of what are called pulps; these are vascular bodies placed in the jaw-bones, and plentifully supplied with nerves and arteries, derived from those which ramify through the jaw or maxillary bones. The mode of their formation is as follows:—The pulp at the appointed time begins to throw out lamina of bone, the fibres of which are concentric; one of these is deposited on the upper part of the pulp, another layer is added underneath this, and so on, not *in* but *on* the pulp.—The pulp is encircled as far as the part that is to correspond to the crown of the tooth by a serous capsule, forming a *cul-de-sac*, and therefore the tooth is not absolutely within the capsule, though it is encircled by it. From the side of the capsule next the pulp the enamel is secreted; this falls on the already formed bone in lines corresponding to the axis of the tooth, thereby giving it great strength. The pulp only secretes lamina of bone at the top to a certain thickness, and then proceeds downwards at the sides, and so goes on to form the root, leaving a hollow space throughout the substance of the tooth; this is, of course, filled by the pulp. The root, as it continues growing, presses against the jaw-bone below, but as it cannot advance in that direction, it pushes upwards and causes absorption, first of the bone above it, and afterwards of the gum, and thus at length it is protruded through the skin. When the tooth cuts the gum it has broken through its capsule, and remains exposed to the air, and uncovered by any membrane as all other bones are. Molar or double teeth, as they are not inaptly called, are formed on three, four, or more of these Pulps, which are united above but separated below, thus forming the fangs. In the Cow, Horse,

Elephant, &c., they are separated above and joined below; the use of this we shall see when considering the molar teeth. These pulps are enclosed in a capsule common to all. When *crusta petrosa* is present, it is supposed to be secreted by the inside of the capsule, but little is known respecting the manner of its formation. Having thus given a brief description of the manner of the growth of teeth, I shall now proceed to examine each kind of tooth in the orders of Mammalia, as it is not my purpose to run over their varieties in the other classes.

Teeth are of three kinds.

I. *Incisores*, Front or incisor teeth. II. *Canini*, Corner or Canine teeth. III. *Molares*, Back, Grinding or Molar teeth. The term tusk is applied to any tooth which projects beyond the lips. The substance, texture, and position of teeth differ considerably from those of other bones. All other bones are covered with a fibrous membrane called periosteum. This is entirely deficient in the exposed part of the teeth. The enamel, which does not extend farther than the gum, is so hard as to strike fire with steel; there is very little animal matter in it, though the bony part or ivory has a considerable quantity in its construction. The tusks of the Elephant, Narwhale, &c., have no enamel, but they have a thin coating of a substance different from the ivory of the tooth.

There is a circumstance which should, I think, be noticed here, and which if kept in mind will explain the great loss of substance in the teeth of Herbivorous animals. It is as follows. In the Carnivorous animals the lower jaw is confined by the nature of its socket to a simple motion upwards and downwards, and hence all these animals tear their food and swallow it in large pieces. Herbivorous animals, on the contrary, not only have the motion upwards and downwards, but also have the power of moving the jaw backwards and forwards, and from side to side, as the food they eat requires to be well bruised and triturated preparatory to its being digested. I now come to the more immediate subject of this paper, viz., the consideration of—I. *Incisores*. Front or Incisor teeth.

Incisor teeth seem to exist in a higher state of development in the *Rodentia* (as the Dormouse, Squirrel, &c.), than in any of the other orders of Mammalia; and not only are they more highly developed, but I believe I may say that they are absolutely necessary to the existence of these animals, which certainly is not the case in any of the other orders. These teeth are found in all the *Carnivora* (as the Lion, Bear, Dog, &c.), but modified in their form to suit the habits of these animals, being in them sharp and angular, and better adapted for tearing than for cutting their food; this is very well seen in the front teeth of the Common Cat. In most Mammalia the incisors of the upper jaw, if they have any, are inserted into the intermaxillary bone; the lower ones occupy a corresponding situation

in the lower jaw. In form and number they are subject to considerable variety. I shall say nothing with respect to them in Man, as I presume every one to be sufficiently acquainted with the form and uses of his own incisors. In the *Rodentia* (as the Mouse, Squirrel, Dormouse, Lemming, Guinea-pig, &c.) these teeth have a sharp, chisel-like cutting edge, and penetrate the jaw-bone to a great depth. In the Rat, Beaver, &c., the lower ones will be found to possess very long roots. In the Marmot the upper ones are the longest. In this class there is a very remarkable provision for keeping a cutting edge constantly on the incisors; the enamel is found to exist, to any thickness at least, only on the anterior surface, and as it is very much harder than the bone, it does not wear out so rapidly, and consequently the tooth is always kept sharp; indeed the more the animal uses them the sharper they will become. The tusks of the Hippopotamus are similarly formed. There is also in this class a wonderful provision made for the very great wear and tear to which these teeth are subject in gnawing nuts, trees, &c. They are, as I before stated, very deeply embedded in the jaw; the posterior part is hollow, and is filled with a vascular pulp, constantly secreting new bone and enamel, which pushes the tooth forwards, and is thus always providing a new surface instead of that which has been worn away by the act of gnawing. This process is continued during the life of the animal, and if one of these teeth be removed, the corresponding one in the other jaw will continue growing, and will in time form more or less of a circle. This occasionally happens to animals in the wild state, as in Rabbits, Hares, &c., so as sometimes even to destroy the animal in consequence of its being unable to use its other teeth.*

These teeth have no *true* root, but will be found to be of the same form throughout. These teeth in the lower jaw extend into the bone as far as the last, but in the upper jaw only as far as the first molar tooth. In some of the *Rodentia* (as the Beaver, Marmot, Squirrel, Dormouse) the incisors are of a brownish colour on their anterior surface.

The *Ruminantia* (as the Cow, Sheep, &c.) have no incisors in the upper jaw, but the gum is formed into a hard and very insensible pad, which answers the

* The teeth of the Rabbit mentioned by Mr. Alington, Vol. II., p. 325, seem to me to have grown in the manner described, in consequence of an original malformation in the lower jaw, it appearing from the plate to be bent downwards towards its anterior extremity, which would give the teeth that direction also, and therefore take them out of the reach of the upper incisors, which must still continue growing, and would eventually assume the form there shewn. The most curious circumstance about it is, that the other upper incisor did not grow in the same way: possibly it may have either been broken off, or else the corresponding tooth in the lower jaw may have been so situated as to allow of some friction taking place between them. We might, I think, infer, from the lower teeth not being of so great a length as the upper, that their growth is slower, and therefore that the chief part of the labour is performed by the upper incisors.

purpose for which it is intended better than teeth would have done. The Camel is an exception to this rule; for though it ruminates it obtains its food in a very different way from the others of the same order, as it feeds chiefly on the tops of shrubs, and the young shoots of trees, which require greater force in breaking off than the blades of grass, to which the pad is beautifully adapted in the other Ruminants. The Camel may also be considered as the link between the *Solidungula* (Horse) and the genuine Ruminants, and therefore some little difference might be expected in some of its organs, if the former explanation were not sufficient. In the *Solidungula* the incisors have processes of enamel running into their substance. The Sloth and Cape Ant-eater are destitute of front teeth. The true Ant-eaters and the Manis have no teeth of any kind, but the food they take requires little if any mastication, and therefore teeth would be of very little use to them. The front teeth of the Walrus have broad flat crowns. The true Balænæ (Black Whale, and White-nosed Whale) have no teeth, but instead of them they have a broad fringe or curtain supported by elastic rods, which commonly go by the name of Whale-bones, and which is most admirably fitted for separating the small animals on which they feed, from the water which is taken into the mouth along with them. The tusks of the Narwhale (*Monodon monoceros*) are of this class. Its generic name *Monodon* (μονος single, and οδους a tooth) is certainly wrongly applied, as well as its specific *monoceros* (μονος and κεϱας a horn); for although only one, generally the left, is seen, yet the other may be found within its alveolus.

I shall now proceed to notice the tusks of the Elephant, which, though not partaking much of the nature of incisor teeth, yet, being inserted into the intermaxillary bone, must be considered under this head. These tusks are only found in the upper jaw, and sometimes grow to an immense size, occasionally reaching seven or eight feet in length. They are produced in the same manner as the incisor teeth of the *Rodentia*, being formed on pulps contained in their posterior extremities, which continue secreting during the life of the animal. They are found in both sexes, and begin to appear in the fourth year. There is no appearance of incisors in the lower law.

II. *Canini*, Corner or Canine Teeth.—These teeth are very well marked in the Carnivorous and many other animals. Their situation is next behind the incisors, from which in some animals they differ little in appearance, while in others they assume a variety of forms. In Man they are not out of the line of the other teeth, but lie uniformly with them. The tusks of the Walrus are of this class, and are used for detaching its food, which consists of shell-fish and marine plants, from the rocks. Many of the Baboons have these teeth of enormous size. In the Lion, Tiger, &c., these teeth present a very formidable appearance, though not projecting so as to constitute tusks. In one species of

Hog (*Sus Babirussa*), the canine teeth in the upper jaw are curved upwards so as to form a semicircle, and often a complete circle. In the common Wild Boar the tusks are often of immense size, and very powerful weapons of offence and defence. In the Bear there are two small canine teeth between the large ones and the molars, and which are also separated from these latter by a considerable interval. Canine teeth are found in the *Solidungula* (Horse) under the appellation of tushes, which are also some distance from the molar teeth. Some have even affirmed that this space was left purposely to receive the bit. The Seals also possess canine teeth, and all their molars partake considerably of the same nature, being pointed and sharp. In the *Ruminantia* we find the camel supplied with these teeth. The Musk (*Moschus moschiferus*) has a long canine tooth on each side of the upper jaw, projecting in the male considerably beyond the lips. The Bat family is provided with four large canine teeth. These teeth in the Mole have two roots like false molars.

III. *Molares*, Back, Molar, or Grinding Teeth.—These teeth are found in all Mammalia that have any teeth; their form is very various, and adapted to the food and manners of the animal. Thus we see the crown of the molar teeth in Carnivorous animals sharp and angular. In the Graminivorous animals, on the contrary, the crowns are broad and flat, and more or less grooved, as their food requires to be much bruised preparatory to digestion. In Omnivorous animals (as Man) these teeth are elevated and more or less angular at the edges, and depressed in the centre. In all classes they are fully adequate to perform the part allotted to them in the function of digestion. The Armadilloes, and the Cape Ant-eater, have molars, but are destitute of incisores or canine teeth. The Narwhale is the only exception to the rule laid down above, as it has merely its tusks, which are inserted into the intermaxillary bone, and are therefore incisors. In Man and the *Quadrumana* or Monkies, the two front molars are smaller in the crowns, and more simple in the roots than the more posterior ones. In these as well as the *Carnivora* (Lion, Tiger, Dog, &c.), and SOME *Rodentia* (as the Marmot) the crown is covered with enamel. In the Horse, Sheep, Cow, Elephant, &c., bony substance is seen on the upper surface of the tooth, running in lines of different forms in each order. In all these animals the enamel runs down into the body of the tooth to a considerable depth. In Graminivorous animals that do not ruminate (as the Horse, Elephant, &c.) the crowns of the molar teeth lie nearly in an horizontal direction with respect to each other. In most of the Ruminants the surface of these teeth is oblique, the outer margin of the upper, and the inner one of the lower tooth being most prominent. In the *Carnivora* (as the Dog, Lion) the crowns of the molar teeth are uneven, and end in pointed processes with depressions between them; these lock into the cor-

responding teeth of the other jaw. All the teeth of the *Carnivora*, and the incisors of *Ruminantia*, have the crowns *alone* covered with enamel, and not running into their substance. Graminivorous animals have a third ingredient, viz. *crusta petrosa*, which I adverted to before, entering into the composition of their molar teeth. This substance is harder than bone, and softer than enamel, and as the teeth of these animals suffer a great deal of attrition, the three substances coming into action at the same time, and being of different degrees of hardness, wear unevenly, and thereby keep a rough surface constantly on the tooth; whereas if one substance alone were engaged, it would soon become smooth, and the tooth would then be nearly useless. The three substances are best seen in a vertical section of an Elephant's tooth. It will then appear that the *crusta petrosa* is the most external, and entirely surrounds the others; it is of a brownish colour. Next comes the enamel, and most internally lies the bone or ivory. Owing to the pulps of the Elephant's tooth being separated at the top, each process of bone is surrounded first by enamel, but as that is limited in thickness, the remainder of the interval between the pulps is filled up with *crusta petrosa*, which is in larger quantity than either of the other substances. It thus fills up all the hollows which would otherwise be present in the tooth, and which would be very inconvenient, as affording lodgment for particles of food, &c. The provision for making up for the wear of the Elephant's grinders is very curious; only one grinder and part of another can be seen at any one time protruded through the gum of the animal. The anterior one is gradually worn away by constant mastication; its fangs and alveolus are then absorbed, the posterior tooth coming forward to supply its place. This process is repeated seven or eight times during the life of the animal, each new one being larger than the one preceding it. This accounts for the teeth of Elephants always appearing more worn at the anterior than at the posterior part. Respecting the molar teeth of *some* of the *Rodentia* I may refer to the first volume of *The Naturalist*, page 48.

In this hasty description of teeth in general, I have purposely avoided going into the details relative to the numbers of each kind of teeth to be found in the various animals I have alluded to, as that subject is fully explained in all works on the classification of animals.

ADDENDA TO MR. MORRIS'S DERIVATIONS OF THE LATIN NAMES OF BRITISH BIRDS.

By Mr. T. B. Hall.

In looking over a list of derivations of the names of our British birds prepared by me a few years ago, I find the following which are not given in the list furnished by the Rev. F. O. Morris, in the second volume of your Magazine (pp. 24, 70, 140), and I have supplied the omissions as far as I am able, in the order they occur there.

Buteo. Βυτεων, from Βυτον, food. Buzzard, so named from their rapacity.

Falco. Or from *falx* a hook. Falcon, so named from their hooked talons and beak.

tinnunculus. From *tinnio*, to chirp, so named on account of its noise. The specific name of the Kestril.

Milvus. Vel potius Miluus, Quasi molliter volans, from its easy flight. Kite.

Strix. Abbreviated from *Strinx*, which is derived from τριζω, to shriek. So named from its noise. Owl.

Noctua. From *nox*, *quia noctua volat*, because it is abroad only in the night. Owl.

Corvus. From *kara*, Heb., to make a noise. So named from their croaking noise. Crow.

Pica. Quasi picta, from its various colours. The specific name of the Magpie.

Upupa epops. Εποψ, from επι upon, and οψις the face, or from *up up*, the cry that it makes. The Whoopo or Hoopoe.

Pyrrhula. Rather πορρυλη, from πορρ red, and ουρα, a tail. Bullfinch.

Passer. A patiendo, because it was anciently supposed to be subject to epilepsy; or from *tsipor*, Heb. Sparrow.

Turdus. Quasi tardus, from their late appearance. Thrush.

pilaris. From *pilus*, hair. The specific name of the Fieldfare.

Œnanthe. Οιναυθη, from οινος wine, and ανθος a flower. A name given to a genus of plants (Dropworts), because their flowers smell like the Vine; but why given as a specific name to the Wheatear?

Hirundo. Ab herendo, from their sticking their nests to the eaves of houses. Swallow.

Columba. From κολυμβαω to swim. So named from their swimming motion in the air. Dove.

Œnas. Οινας from οινος wine. So called from its colour, which is like the black grape. The specific name of the Stock Dove.

turtur. From *tur*, Heb., the Turtle. The specific name of the Turtle Dove.

Perdix. Περδίξ, from περδω to make a noise. So named from the noise they make in calling. Partridge.

Tetrao tetrix. Perhaps from the Latin adjective *teter*, dark, &c., on account of their colour. The Black Grous.

tetrix. Same derivation. The specific name of the Little Bustard.

Vanellus. Or from *vannus* a vane, on account of the noise and flutter of the wings. Lapwing.

Charadrius. Χαραδριος, from χαραδρα, an excavation or fissure, on account of their inhabiting the fissures of rocks. Plover.

Scolopax. Σκολοπαξ, from σκολοψ a stake, on account of their long bills. Woodcock and Snipe.

Ibis. Ιβις or ιϐας, from ιϐυω to cry out, because of its noisy cry. Ibis.

Grus. Γερανος, from *geroa*, Heb. Crane.

Ciconia. From the Cicones, a people of Thrace, who hold this bird in veneration. Stork.

Larus. Λαρος, from λαω to covet, because of their rapacity. Gull.

Cygnus. Κυκνος, from κυκναω to disturb, on account of the great disturbance they make in the water with their bill in search of food. Swan.

Anser. Anser. From *anza*, Syr. Goose.

Anas. *Anas*. Νησσα, from νεω to swim, *a nando*. Duck.

Querquedula. Named from its cry. The specific name of the Gargany.

The following names occur in my list, but are not given by Mr. Morris; they are principally specific names.

Phalacrocorax. Φαλακροκοραξ, from φαλακρος bald, and κοραξ a Crow, because the top of the head is white and appears bald. Cormorant.

argentatus. From *argentum*, silver.

arquata. *Ab acuata rostri forma*, from the curved form of the bill.

acutus. *Acule*, from *acuo* to sharpen.

cannabina. From *Canna*, a Reed.

canus. Χαινος, from *vakan*, Heb., an old man. Grey-haired or headed.

fistularis. From *fistula*, a pipe.

ictinus. Ικτινος, from ικταρ, very quick.

igneus. Fiery, bright.

lanarius. From *lana*, wool. Woolly, &c.

lotor. A washer.

Nisus. *Niza*, from *nazah*, Heb., to fly.

Pygargus. Πυγαργος, from πυγα the rump, and αργος white.

rupestris. From *rupes*, a rock or hill.

solitaris. From *solus* alone. Solitary.

trochalis. } From *trochus*, a top, which is derived from τροχος a wheel.
trochilus. }

trivialis. Ordinary, trivial, &c.

I have in the foregoing list repeated some names for which derivations have been given in the former papers; but it is only in a few instances, and occurs where I consider the derivations I have given may perhaps be preferable, or that some little additional light is thrown upon the subject, as is the case with *Cygnus*, *Scolopax*, *Pyrrhula*, *Upupa*, *Falco*, *vanellus*, *tinnunculs*, &c. Mr. MORRIS seems to think that some of the derivations supplied through your kindness are not very good, but I find that in most instances they are the same as in my list, as, for example, I have *Alauda*, the same as given by you (*a* from, and *laudo*, to praise, &c.), on account of its song. But I think that *rubetra* and *rubeta* are most likely derived from *ruber*, red. Instead of the one you give for *luscinia* (*lugens*, mournful, and *cano*, to sing), I think "*quod lucis canit*, because it sings in woods and groves," preferable. As regards *Ardea*, I have the following derivations. BLANCHARD, like yourself, derives it from *arduus*, lofty, because it flies high. Some from the city Ardea, from whose scattered embers, according to OVID, this bird was generated: or from αηρ the air, and δυω to penetrate, because of its swift flight. *Gallinula* is the latin for a pullet or little hen, and *gallinago* is the diminutive of *gallus*, a cock. The derivation of *spinus* is *quasi spiculina*, being the diminutive of *spica*, a thorn.

In making out lists of the derivations of names, I consider it a far preferable plan to arrange the generic names alone and alphabetically, and then the specific ones afterwards, which saves much unnecessary repetition, as it will occur to your readers how often some of the Latin adjectives are repeated as specific names, such as *vulgaris*, *pratensis*, *rupestris*, *communis*, *marinus*, *nigra*, &c. &c., and to repeat the derivation of them every time is quite unnecessary.

I trust you will not consider the above remarks entirely out of place. I would have sent them earlier, but, having mislaid the numbers of *The Naturalist* containing Mr. MORRIS's "Explanations," was obliged to defer their transmission till this time.

Woodside, Liverpool,
Jan. 26, 1838.

BRITISH FLOWERING PLANTS FOR MARCH.

(Continued from page 87.)

Netted-rooted Crocus, *Crocus reticulatus;* Purple Spring Crocus, *C. vernus;* Spurge-laurel Mezereon, *Daphne laureola;* Common Mezereon, *D. mezereum;* Hare's-tail Cotton-grass, *Eriophorum vaginatum;* Early Knappia, *Knappia agrostidea;* Broad-leaved Hairy Wood-rush, *Luzula pilosa;* Common Daffodil, *Narcissus pseudo-narcissus;* Annual Meadow-grass, *Poa annua;* Sloe, or Black-thorn, *Prunus spinosa;* Two-leaved Squill, *Scilla bifolia;* Smooth-leaved Elm, *Ulmus glabra;* Dutch Cork-barked Elm, *U. major;* Cork-barked Elm, *U. suberosa;* Sweet Violet, *Viola odorata;* Common Alder, *Alnus glutinosa;* Maiden-hair Spleenwort, *Asplenium trichomanes;* Common Daisy, *Bellis perennis;* Common Hazelnut, *Corylus avellana;* Hairy Ladies'-smock, *Cardamine hirsuta;* Yellow Whitlow-grass, *Draba aizoides;* Common Whitlow-grass, *D. verna;* Corn Horse-tail, *Equisetum arvense;* Wood Spurge, *Euphorbia amygdaloides;* Red Shrubby Spurge, *E. characias;* Stinking Hellebore, *Helleborus fœtidus;* Rock Hutchinsia, *Hutchinsia petræa;* Henbit Dead-nettle, or Great Henbit, *Lamium amplexicaule;* Strawberry-leaved Cinquefoil, *Potentilla fragariastrum;* White Poplar, *Populus alba;* Grey Poplar, *P. canescens;* Aspen or Trembling Poplar, *P. tremula;* Black Poplar, *P. nigra;* Common Butcher's-broom, *Ruscus aculeatus;* Rose Willow, *Salix helix;* Boyton Willow, *S. Lambertiana;* Olive-leaved Willow, *S. oleifolia;* Prostrate Willow, *S. prostrata;* Purple Willow, *S. purpurea;* Auricled Osier Willow, *S. stipularis;* Common Groundsel, *Senecio vulgaris;* Common Yew, *Saxus baccata;* Shepherd's Purse, *Thraspi bulsa-pastoris;* Colt's-foot, *Tussilago farfara.*

CORRESPONDENCE.

Prize-essays on the Turnip-fly.

To the Editor of The Naturalist.

Sir,—The Prospectus of the Prize-Essays for the Entomological Society for the year 1838 is to the following effect, as already advertised both in the Natural History periodicals and the London and provincial papers.

Prize Essay on the *black grub* of the Turnip.—An arrangement has been made between the Entomological Society of London and the Agricultural Society of

Saffron Walden, whereby the sum of ten guineas has been proposed to be given to the writer of the best essay (to be drawn up from personal observations) upon the natural history, economy, and proceedings of the insect injurious to Turnips known under the name of the Black or Nigger Caterpillar (*Athalia centifoliæ*), to be illustrated by figures of the insect in its different states, together with the result of actual experiments, made for the prevention of their attacks, or the destruction of the insects themselves. The essays must be accompanied by testimonials of the success of the remedies proposed by the writers, and must be forwarded to the Secretary of the Entomological Society, at No. 17, Old Bond-Street, London, with fictitious signatures, on or before the *fourth Monday in January*, 1838, when they will be referred to a Committee, to decide upon their respective merits, after which, with the permission of the writers, the prize-essays and any others of value will be published.

The prize-essays must be accompanied by a sealed letter, indorsed with the fictitious signature adopted by each writer, and including his real name and address.

I am, Sir,

Yours very obediently,

London, Jan. 16, 1838. J. O. WESTWOOD.

[From the letter with which Mr. WESTWOOD has favoured us, it will be perceived that the prize-essays could not be received later than Jan. 22, but as the communication furnishes the information requested by "PHILANDER" at p. 45, we have thought it best to publish it. We found it impossible to transmit Mr. WESTWOOD'S epistle in MS. to "PHILANDER" in time to be of any service.—ED.]

CHAPTER OF CRITICISM.

ACEPHALOUS MAMMALIA.

To the Editor of the Naturalist.

MY DEAR SIR,—In the fifteenth number of your Magazine (Vol. II., p. 490) there is notice of a lamb without a head. These *lusus naturæ* are not so extraordinary as your correspondent seems to think. In the process of the development of the embryo, one part of the system may be stopped in its growth whilst the rest may go on developing in a normal manner. It is on this ground that all varieties of monstrous formations can be explained, and thus those forms which at first sight would appear to be departures from the laws of

Nature, do but confirm its laws. Acephalous monsters of the kind above mentioned occasionally occur in the human species.

Errata in a Paper on New Zealand, by T. K. Short, Esq.

In Mr. Short's interesting paper on New Zéaland, in the last number of your Journal, there are a few errors with regard to the names of plants which I beg to point out. At page 3, "*Damara*" ought to be *Dammara*; "*Melicytis*," *Melicytus*; "*Adeantum*," *Adiantum*; "*Agara*," *Agavia*; "*Arracaria*," *Araucaria*; "*Psedium*," *Pselium*.

[The proof of the paper alluded to was corrected by its author.—Ed.]

Mr. Crosse's Experiments.

Perhaps you will allow me to make a remark or two on your review of Mr. Murray's *Considerations on the Vital Principle*. I have not seen Mr. M.'s pamphlet, but I should think, from what lately transpired at the Meeting of the British Association, with regard to Mr. Crosse's celebrated experiments, that any further refutation was hardly needed, especially when combined with an attempt to stigmatise with the name of "atheist" those who hold, probably, the existence of a Deity with as much if not more regard than their defamers. But you state that the periodical press has been universally apathetic, and that scientific men, on account of their aversion to new theories, have been inert with regard to it. I think, when these experiments were first promulgated, that the periodical press gave them the widest circulation, for there are few persons who read at all but what have heard of them. With regard to the inertness of scientific men, I think this is hardly a fair charge, when we recollect that it was through the too ready credence that two or three scientific men gave to Mr. Crosse's experiments at Bristol, that he was ever induced to publish them. Mr. Crosse undoubtedly suspected that he might have overlooked some source from which the insects came which he had observed at the poles of his galvanic battery, and therefore had wisely concluded not to lay his experiments before the public; and it was the too ready admission of the facts, by some who ought to have examined them thoroughly, before they ventured on giving their opinion of the possibility of creating insects, which has been the cause of so much unnecessary alarm in certain circles, as also of exposing British science to the charge of empiricism. In your report of the Proceedings of the British Association will be found some experiments instituted by Messrs. Children, Gray, and Bird (Vol. II., p. 425), which I think satisfactorily prove that Mr. Crosse's insects were obtained from some external source, and not brought into existence by Galvanism. Some have supposed that the ova of the insects might have been fossilised, and

developed by the action of galvanism; but we have no evidence whatever of the existence of fossil *Acari* in siliceous rocks (the substance used by Mr. Crosse), which appears to be the one that generally inhabits cheese in the present condition of our globe.

I remain,

Yours sincerely,

Edwin Lankester.

[The periodical press certainly did circulate the supposed result of Mr. Crosse's experiments, as it would have circulated an account of a "sudden death" or other "mysterious occurrence," but, for all that, we consider apathy to be justly chargeable upon their pages. Respecting the scientific men, it appears that we were in some degree mistaken; and are glad to find that the timely and judicious experiments performed by Messrs. Children, Gray, Golding Bird, and others, have succeeded in placing the affair in its proper light. If all new discoveries were thus promptly put to a fair test, instead of being despised and ridiculed, the truth could not long remain concealed. But personal interest, as well as apathy and prejudice, too frequently forbid so decisive a mode of procedure. —Ed.]

Lining of the Wren's Nest.

To the Editor of the Naturalist.

Dear Sir,—The Wren's nest which I mentioned (Vol. II., p. 131) as not having any lining, had not, as you supposed, even a lining of other materials than feathers. It had not an appearance of any thing of the sort. I have repeatedly found the nest of this bird without any feathers, and with only a few Horse or Cow hairs.

I am, dear Sir,

Your obedient servant,

December 17, 1837. Beverley R. Morris.

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

ROYAL SOCIETY.

This Society met on Thursday, Jan. 25, Francis Baily, Esq., vice-president and treasurer, in the chair.—Bryan Donkin, Esq., and Sir John Hansler were admitted Fellows of the Royal Society. The following candidates were also

elected Fellows:—NEIL ARNOTT, M.D., the Rev. WILLIAM CURETON, M.A., CHARLES LOCK EASTLAKE, Esq., R.A.

A paper was read, entitled "Fourth Letter on Voltaic Combination," addressed to Professor FARADAY, by Professor DANIELL.

ROYAL ASTRONOMICAL SOCIETY.

Her Majesty's government have just granted to this Society the sum of £500, for defraying the expenses of repeating the celebrated and interesting experiment of the late Mr. CAVENDISH, for determining the mean density of the earth, and for considering the practicability of which a Committee was appointed about two years since. The apparatus is at present in the course of erection at Mr. BAILY's house, and, as soon as it is completed, the experiments will be commenced.

ROYAL GEOGRAPHICAL SOCIETY.

A very full meeting of members was held on the 22nd of January, for the purpose of hearing the report of Captain ALEXANDER, of his late expedition in the interior of Central Africa, directed towards the north-west coast and the Damhara country. This expedition, originating with the Society by whom the expenses were paid, with the assistance of a grant from government, was delayed some time till the termination of the Caffre war; but in September, 1836, Capt. ALEXANDER started on his journey, from which he returned home to the Cape on the 20th of September, 1837. During this period he traversed an extent of 4,000 miles, of which 2,000 were by walking, 1,000 by Horses, and 1,000 on the backs of oxen. With the exception of four or five German missionaries, the whole country was new to Europeans for a distance of 1,000 miles. The paper was replete with interesting details. The tribes visited were the Namacquas, Bushmen, and the two great nations of the Plain and Hill Damharas, all of whom showed a friendly spirit to the members of the expedition, and exhibited a wish for further intercourse with Europeans. The two latter are negroes, partaking of all their marked characters, and beyond them resides a nation of red men, whom, however, it was found impossible to visit, on account of a war which was raging between the Damharas. From a female belonging to the Hill Damharas he purchased, for two cotton handkerchiefs and two strings of beads, a little boy, about seven years of age, who was in a half-starved condition, and employed in hunting Lizards for food. The appearance of this singular juvenile native in the room, along with a great variety of their domestic and warlike implements, excited considerable curiosity and attention. At different periods the expedition suffered much for want of water, of which they were at one period destitute for nearly three days, with the thermometer upwards of 100 degrees in the shade, and losing several of their oxen, Sheeps, and Dogs; and at one time they were so

short of food as to be compelled to eat leather. On the coast they also discovered several points affording good accommodation for vessels, and through which a beneficial intercourse might be carried on with the interior. Near the mouth of the Orange River they discovered large quantities of copper ore, a sample of which had been analyzed by Sir John Herschell at the Cape, and found to contain 75 per cent. of copper, which was also easily accessible, and might either be smelted with Orange River Wood, or carried up the river on rafts.—*Atlas.*

SHEFFIELD LITERARY AND PHILOSOPHICAL SOCIETY.

Early in January the members of this Society held their annual meeting in the Music Hall, when the report was read and adopted. Besides the ordinary vote of thanks passed to the officers, gratuitous lecturers, and donors of the Society, an especial and warm vote of thanks was passed to the family of the late Hall Overend, Esq., for the munificent donation of his museum. A letter was read from Mrs. Margaret Stovin, presenting to the Society some botanical specimens, and offering others, as well as several rare and curious scientific books. On the motion of Mr. Gainsford, it was unanimously agreed that the Council of each year should be empowered to provide lectures for the first four months of the ensuing year. Dr. Favell was elected President for the ensuing year. Vice-Presidents—Rev. J. Blackburn, Dr. Knight, Wilson Overend, Esq.; Secretaries —Rev. W. R. Smith, Mr. Boultbee; Curator—Mr. William Jackson; Treasurer—Offley Shore, Esq.; Council—T. A. Ward, T. R. Barker, William Lucas, John Ward, R. J. Gainsford, Henry Jackson, Rev. H. Farish, Rev. H. H. Piper, Dr. Holland, J. H. Abraham, and T. Greaves.

GEOLOGICAL SOCIETY OF THE WEST-RIDING OF YORKSHIRE.

We have received a prospectus setting forth the rules proposed to be enforced by the Society recently established under the above title. We place the document before our readers without alteration or comment.

1. That a Society be formed for collecting and methodising geological and mathematical information in connection with the Coal-field of Yorkshire; and that it be called "The Geological Society of the West-Riding of Yorkshire."

II. That the Members of the original Committee, and the gentlemen now present, together with all who may apply to the Secretary before the next meeting, be Members of the Society on their conforming to the rules.

III. That any person who is desirous of becoming a Member after the next meeting, must be proposed by a Member, in writing, to the Secretary, and balloted for at the ensuing general meeting.

IV. That the annual subscription be half-a-guinea, and that it be due on admission, and at the annual meeting.

V. That the officers of the Society be a President, Vice-Presidents, a Committee of nine (of whom three shall be a quorum), and a Treasurer and Secretary, who shall be ex-officio a Member of the Committee; and that three of the Committee retire annually.

VI. That the officers be elected at the annual meeting, and be capable of being re-elected.

VII. That the following noblemen and gentlemen be requested to accept their respective offices :—

PRESIDENT :

Earl FITZWILLIAM.

VICE-PRESIDENTS :

Earl of SCARBOROUGH,	T. W. BEAUMONT, Esq.,
Earl of MEXBOROUGH,	J. SPENCER STANHOPE, Esq.,
Earl of EFFINGHAM,	R. O. GASCOIGNE, Esq.,
Lord WHARNCLIFFE,	C. J. BRANDLING, Esq.,
Lord STOURTON,	W. B. MARTIN, Esq.,
Sir J. L. L. KAYE, Bart.	G. L. FOX, Esq.

COMMITTEE :

Rev. S. SHARP,	Mr. EMBLETON,
Mr. J. CHARLESWORTH,	Mr. FIELD,
Mr. JOS. CHARLESWORTH,	Mr. BIRAM,
Mr. HARTOP,	Mr. HOLT.
Mr. BRIGGS,	

TREASURER & SECRETARY :

Mr. THOMAS WILSON.

VIII.—That the meetings be held at Wakefield, on the first Thursdays in March, June, September, and December, at eleven o'clock.

IX.—That at the meetings, each Member be allowed to introduce one or more strangers.

X.—That the following gentlemen be elected Honorary Members :—

Professor PHILLIPS,
Dr. SMITH.

ORNITHOLOGICAL SOCIETY.

It is really a treat for the ornithologist to spend an hour by the beautiful piece of water in St. James's Park. Almost all the birds acquired the full use of their wings at their last change of plumage; yet none of them—even when their locale was covered with skaters—left the place; but clustered dolefully upon the ice,

until an opening was broken for them two or three days afterwards; and ever and anon a few would rise and wheel about over the heads of the visitors. It is surprising that they evince so little desire to fly, though it is much to be feared that some will take their departure towards the breeding season. Probably, however, they would return, with their broods, if unmolested during their absence. At present the only species at all inclined to wander are the common Wild Ducks, Gadwalls, Shovellers, Garganies, Pintails, Teals, Wigeons, Red-headed and Tufted Pochards, Polish Swans, one or two Gulls, the Bitterns, and one of the Storks. The latter soars till he is out of sight every morning, and frequently flies for several minutes at a time during the day. Almost all of the birds are so tame as to come and eat readily from the hand. Next autumn others, as the Spoonbills, will acquire the use of their wings; but there are many of most of the above kinds, together with a beautiful Smew, some Golden-eyes, &c., which have the pinion amputated, and perhaps it is as well to serve two or three pair of all the more valuable species in a similar manner. There are at present about thirty species, and of several of these a considerable number of individuals. It is, however, expected that the collection will be materially enlarged next autumn, without much expenditure of funds. It is to be hoped that the Society will duly fulfil their intention of obtaining a complete collection of well-preserved British birds, and that they will overlook no opportunity of advancing the study of Ornithology. It is obvious that the Institution may do much for the welfare of the science, no less than for the amusement and gratification of the public in general; but in order fully to carry out their numerous and important objects—enumerated Vol. II., p. 94—they must be liberally supported, both by the accession of members and the donation of specimens, books, &c. Indeed, the claims the Society possesses on the public will at once point out the propriety of the funds being amply cared for by all who have the welfare of the Society at heart.

EXTRACTS FROM THE FOREIGN PERIODICALS.

ZOOLOGY.

1. Anatomy of *Pentastoma tænioides*.—From p. 100 of our present volume we continue our translation of M. Miram's paper on *Pentastoma tænioides*.

The organs of suction consist of five openings, as indicated by the name *Pentastoma*. At a half-line of the anterior ridge, on the middle of the head, there is a rounded tubercle; it seems to correspond to the buccal opening, which I had not

before noticed with sufficient accuracy. On each side of this tubercle are two elongated openings, somewhat arched, and crescented: each of these openings incloses a tooth (*crochet*) of a light brown colour, the base of which is directed towards the tail of the animal. These openings enable the worm to suck, and the teeth are to fix themselves more firmly. In fact, every time that I endeavored to detach a living individual from the spot to which it adhered, I found that the animal's head was severed before it loosed its hold.

The head of the male, immediately after its immersion in alcohol, has the appearance of a cavity, so that the suction-apparatus is placed upon a hollow surface. No distinct separation is observed between the head and the rest of the body, because the smooth membrane which covers the head extends, plaited, gradually over the whole body. This is again covered by a smooth membrane, thin and plaited; but the two sexes differ remarkably with respect to this plaiting, more so than as regards that of the anterior parts seen across.

In the male, indeed, the plaits extend from the head to the end of the tail, and the lateral ridges are neither so distinct nor so well formed as in the female. In the latter, on the contrary, the plaits disappear entirely at an inch and one-fourth from the caudal extremity, and do not extend over the whole surface of the back as in the male. They are only visible at the sides, and vanish altogether in the region of the ventral cavity. The lateral ridge itself appears not to be wholly uniform in the female, but at the part where the plaits disappeared, the regular points which followed immediately after likewise vanish.

The ventral surface of the male presents a large white band, across the skin; it takes its origin near the head, passes over the middle of the body, and terminates close to the tail. It is there the right testicle, for the left is covered by the intestinal canal, which is not seen here, but only at the caudal extremity. On the back, immediately behind the head, are two small spots, sometimes visible to the naked eye; these are the genital openings, through which the two cirrhi of the male probably pass. Behind these two openings are seen two white flexuous organs; these are the two testicles, one of which is already seen upon the ventral face. Further back is the anal aperture of the intestinal canal, which is situated at the end of the tail, and which seems to divide the latter.

In the ventral region of the female, immediately behind the head, are two indistinct blind vessels, which belong to the sexual apparatus, and not, as Rudolphi conceived, to the intestinal canal. Between these vessels are others of a brown colour, describing a sinuous course. They extend nearly to the caudal extremity, and constitute the oviducts; they are followed by a simple filament, the intestinal canal, which here distinctly divides the tail.

On the dorsal surface, at the part where the head is slightly arched, are seen the two blind vessels before mentioned, and between them an obscure spot, which

is the stomach. Then the brown flexuous oviducts again part, to join the tail. Immediately behind the stomach is a vessel divided a little from right to left, and which passes directly towards the left side; it is the ovary full of eggs. The intestinal canal again appears near the tail.

Such, says M. Miram, are the outward parts of the body; I now pass to the description of the internal organization of this remarkable Worm. In order to do this with the more accuracy, I will begin with the organs which first present themselves to sight, on removing the skin, such as the organs of motion; afterwards those of digestion, then those of sensation, and, lastly those of generation.—*Annales des Sciences Naturelles.*

[Unless under extraordinary pressure of other matter, we shall make a point of continuing the paper of which we have given our readers a glimpse, in future and early numbers.—Editor.]

BOTANY.

2. On the Connection of the Cells of Plants.—This is an inaugural dissertation by M. Mohl, written in German, and published in 1835. Our extract is from the *Bib. Un. de Gen.*

The earlier anatomists considered either the cellules or the vessels as cavities acting in the midst of a homogeneous substance. This theory became inadmissible after the works of Grew and Malpighi, the discovery of intercellular passages, and that of a double coat wherever two cells meet. The existence of vessels and cells, as distinct organs, was generally admitted; but the manner in which these cells were united still remained a disputed point. The majority of observers considered them to be intimately united to each other by their coats, while others described an intermediate substance contained in the interstices. Moldenhawer supposed he saw this substance in the form of a bundle of very delicate fibres, surrounding each cell, and enveloping the whole like network; but no one has since been able to discern these pretended fibres.

Agardh, in his *Organographie* (1831), mentions a mucous substance very abundant in *Algæ*, especially in the lower groups, where it forms the principal element of the plant. The cells contained in this membrane collect it in their interstices in proportion as they increase. Agardh believes this mucous substance to exist in the higher orders of vegetation, and that the cells are connected by their edges, by the assistance of this same substance, hardened in the shape of fibre.

M. Mohl, in his *Recherches sur les Troncs des Fougères en Arbre (Researches on the Stems of Arborescent Ferns)*, and his work *Sur le Pollen (On Pollen)*, is convinced of the existence of this mucous tissue, without, however, agreeing with Agardh respecting details. He admits in his memoir:—1st., that the

substance which, in *Algæ*, surrounds the cells, is found in higher plants, though in a smaller quantity; he names it "intercellular substance"; 2nd., that this substance is always homogeneous, and is never seen in the fibrous form.

Illustrations of various organs, as seen under powerful magnifiers, accompany this work. They explain the point under consideration with great clearness. Let us follow the author in the account of the observations which led him to the above conclusions. He there notices the tissue in different plants, passing from the lowest classes of the kingdom up to the most complicated.

In *Nostochineæ* the intercellular substance forms nearly the whole plant. It exists in a semi-liquid indeterminate form, and serves as a matrix to the cells which it connects. In the *Oscillatoriæ* the cells are already united at each end, like beads on a string. Each of these cellular filaments is covered with a case of more compact cellular substance. The cellular thread may easily be removed, when the homogeneous structure of the casement, in a single piece, is distinctly seen. A certain number of chaplets and their envelops are reunited by other more fluid intercellular matter, and form an aggregate of different structures.

In *Scytomena* and *Confervæ*, the organization is similar, except that the cellular threads and their envelops are no longer united, but form distinct parts.

Passing from those species of *Algæ* where the cells are arranged in a single row, end to end, to those of a more complicated structure, where the cells are in many rows, the same substance still occurs, not only on the exterior of the plant, but also in the interstices of the cellules. If these cellules are few and distant from each other, the intercellular substance is very abundant, and forms the greater portion of the tissue. If, on the contrary, the cells are united, it is collected at the corners, and is only found in very thin layers between the coats of the cells. These two cases are observed in marine *Algæ*. Intercellular passages have never been discovered here, on account of the substance which fills all the voids.

It is found in Lichens, but less abundantly. It must be looked for between the rounded cells which form the external layer of the thallus.

In higher plants, with distinct leaves, the intercellular substance is less easily seen, on account of the existence of passages, and because of the greater pressure of the cells. There is, however, perhaps no plant in which it is not found in one organ or another.

In Mosses and *Jungermanniæ* it is distinctly seen towards the extremity of the leaves, in the intervals of the cells.

In Ferns it is very evident between the elongated cellular tissue surrounding the vessels. The rhizoma of *Pteris aquilina* (the Common Brake), and the stems of arborescent Ferns, furnish excellent examples; but care must be taken not to confound with intercellular substance the external layer of cells, which is

coloured in the same manner. A thickness not its own is therefore sometimes attributed to the substance. The same precaution must be observed in all the woods of Dicotyledons. In *Coniferæ*, for instance, the lines of separation between the substance and the cells are much less cut off than those between the internal and external layers of these cells. It is, therefore, easy to make a mistake.

In order clearly to observe this matter in the cellular tissue of wood, the hard tropical woods, or our Box-tree, should be selected. It is much more difficult to detect it in the majority of our indigenous trees, because the cells are there extremely small, and closely connected.

It is well characterised in the elongated cellular tissue of the bark and petioles of the greater part of phanerogamous plants, as the Elder (*Sambucus nigra.*)

In parenchyma, or rounded cellular tissue, the cellular matter is so small in quantity that it generally eludes observation. Hence the existence of passages which are but empty spaces caused by the scarcity of this substance. It is, however, still obvious in tough leaves, as the Laurel (*Laurus nobilis*). The facility with which the cellules can be separated sufficiently proves its existence in all rounded cellular tissue, even in cases where its extreme tenuity and transparence prevents its being distinctly seen.

The albumen of many Monocotyledons contains it, whether between the cells or at the surface, and it covers them with a homogeneous layer (as in *Lilium martagon*).

The external membrane which M. Brongniart has detached from the cuticle by maceration, is but a homogeneous layer of the same substance, which fills not only the intervals of the cells of the cuticle, but also covers them on the outside with this pellicle.

Lastly, the external envelop of grains of pollen is almost always composed entirely of intercellular substance.

These and other observations illustrate the important part which the substance under consideration performs in the vegetable kingdom. Its study, carried still further, will one day lead to interesting results on many physiological points. The theory of the ascent of juices by the intercellular passages is already rendered little probable, since these passages are only exceptions to the normal state of the plant.

This substance is semi-fluid, sometimes hard and solid, but never fibrous, transparent, perfectly homogeneous, and almost always very hygroscopic. Its chemical properties appear to be analogous to those of the cellular tissue which it envelops, and vary, consequently, according to the species and the organs in which it is observed. But M. Mohl has not yet distinctly described its chemical nature and physical properties.

CHAPTER OF MISCELLANIES.

ZOOLOGY.

Prolificacy of the Blackbird.—A pair of these birds built four successive nests last season upon the island in St. James's Park, and succeeded in rearing seventeen young ones; the three first broods consisting of five each, and the last of two only. There cannot be the least doubt as to the identity of the female, as she is well known to the person who attends them, and so tame as to take food from his hand while sitting on the eggs. There were, moreover, no other individuals of the same species near the place.—Another isolated pair which I knew of raised, unmolested, three broods in a garden near my residence, so that the Blackbird would appear to raise as many young as the Partridge, which produces only one brood in a season.—Edward Blyth, *North Brixton, Surrey, Jan.* 21, 1838.

Mode of taking Grease out of Insects.—Those readers of *The Naturalist* who are commencing the study of Entomology have reason to be grateful to Mr. Dale for his instructive "Hints" in the Feb. No. (p. 81). To these I wish to add another, which is not generally known, and which I think will be found useful. Specimens in cabinets are often ruined by the transudation of the oily matter with which their bodies are charged. This at first appears in spots on the thorax and abdomen, and afterwards gradually pervades every part of the insect. Mr. Samouelle recommends his readers to "powder some fine dry chalk on a heated iron, cover the chalk with a very fine piece of linen cloth, and thereto apply the under part of the body of the insect: the heat dissolves the grease, while the chalk absorbs it, and the cloth prevents the chalk from clotting the insect."—*Ent. Useful Comp.*, p. 320. This is a very troublesome method, to say the least of it. I should recommend in its stead the following, as far preferable. Dip the greasy specimen into spirits of wine, or turpentine, until it is well soaked. Then place it in a situation exposed to a current of air—near a window, slightly opened, will answer the purpose well. The spirit in a short time evaporates, takes off the oily matter, and the insect is cleansed.—Peter Rylands, *Bewsey House, Warrington, Feb.* 3, 1838.

A Child carried away by a Baboon.—Flocks of Baboons are known to infest the gardens in the suburbs of Calcutta. A native woman of Soorah left a child about two months old on a little bed in her compound, besmeared with oil (a native practice), and went away for a minute or two. No sooner had she left the place, than a large Baboon jumped from a tree close by, and taking the infant in his embrace, ran up the tree again. The cries of the child immediately

brought the mother to the spot, with many others. It was plain the child was well treated by the Baboon, for he handled it with much kindness. Some Plantains being placed under the tree, the Baboon came down and secured the fruit, but did not let go his hold on the child, although the people had hidden themselves. Soon it grew less sceptical, and, placing the child on *terra firma*, ate another Plantain. At this moment the people appeared and shouted, thinking to terrify the Baboon from his charge; but the animal was not to be so caught. It seized the child again, and leaped from one tree to another, and so on, pursued by the people, screaming and shouting, for a quarter of an hour or more. The Baboon was then observed to leap over a tree without its victim: this was alarming, for none could guess what had become of the child, until they heard its cries. It was then found, uninjured, embedded in the rotten trunk of the tree on which the Baboon was seen last.—*Parbury's Oriental Herald.*

Consumptive Animals.—Alluding to the fact mentioned by Mr. Allis in *The Naturalist*, p. 28, a cotemporary observes:—We mentioned this singular case to a friend, who has had the best means of acquiring anatomical knowledge, and he informs us that he has dissected three Parrots, great favourites, which had been sent to the late Mr. John Wilson, curator of the Edinburgh Museum, to be stuffed, in which the lungs were reduced to the same state as that described by Mr. Allis. He has also dissected two Monkies which, during life, presented the usual symptoms of consumption, and whose lungs, on dissection, were thickly studded with tubercules, in every different stage. In one case the upper lobe on the left side was a mass of matter. Generally speaking, the hard, dry cough to which the Monkey tribes are subject in this country, depends on what medical men call *bronchitis*, or inflammation of the lining membrane of the air tubes, and which, in its chronic stage, presents many of the symptoms of pulmonary consumption. A return of summer, or removal into a dry, warm place, is in many instances sufficient to remove the symptoms.—*Sheffield Iris.*

Severity of the Weather, and Abundance of Birds.—Owing to the continuance of the frost, there is a great variety of birds in the Liverpool markets, and ornithologists are reaping a rich harvest in making great additions to their collections, or, as a friend of mine observes, "making hay while the sun shines." The dealers of objects in Natural History have been on the alert in picking up the rarer species of Ducks, &c., but I am informed that the market people always make a point of asking them twice their usual price for a bird, well knowing that unless it was a rare bird, they would not care about purchasing it. The following list has been furnished me through the kindness of Mr. Henry Johnson, curator of the Royal Institution, who has added a few rare birds to their collection. Of the following species he has not noticed in the market more than a solitary specimen or two:—

Canada Swan, *Cygnus Canadensis**; Pintailed Duck, *Anas acuta*, a very fine specimen, purchased for the Institution; Common Coot, *Fulica atra*†; Brent Bernicle, *Anser torquatus*; White-fronted Goose, *Anser albifrons*, shot at Leasowes, and purchased for the Institution; Goosander, *Mergus merganser*.

The following species have been rather more abundant:—Scaup Pochard, *Fuligula marila*; Teal, *Anas crecca*; Oyster-catcher, *Hæmatopus ostralegus*; Common Gallinule, *Gallinula chloropus*; Water Rail, *Rallus aquaticus*; Redwing, *Turdus iliacus*; Green Grosbeak, *Fringilla chloris*; Yellow Bunting, *Emberiza citrinella*; Quail, *Perdix coturnix*; Bar-tailed Godwit, *Limosa rufa*; Common Shieldrake, *Tadorna Bellonii*; Whimbrel, *Numenius phæopus*.

The following species have been exceedingly abundant:—Common Mallard, *Anas boschas*; Wigeon, *Mareca penelope*; Common Pochard, *Fuligula ferina*; Tufted Duck, *Fuligula cristata*; Wild Goose, *Anser ferus*; Common Curlew, *Numenius arquata*; Redshank Sandpiper, *Totanus calidris*; Golden Plover, *Charadrius pluvialis*; Grey Plover, *Vanellus griseus*; Crested Lapwing, *Vanellus cristatus*; Dunlin or Purre, *Tringa variabilis*; Blackbird, *Turdus merula*; Song Thrush, *Turdus musicus*; Fieldfare, *Turdus pilaris*; Missel Thrush, *T. viscivorus*; Starling, *Sturnus vulgaris*; Sky Lark, *Alauda arvensis*; Ring Dove, *Columba palumbus*; Common Linnet, *Fringilla cannabina*; Common Pheasant, *Phasianus Colchicus*; Common Partridge, *Perdix cinerea*. I have had one or two very fine specimens of the Black-headed Gull, *Larus ridibundus*, given to me: they were shot on Bidstone Marsh.—T. B. Hall, *Woodside, near Liverpool, Feb.* 1, 1838.

Aerial Augurs.—Countless flocks of birds, having the appearance of Fieldfares in the distance, past over the north-eastern parts of the metropolis, in a southerly direction, at the end of last week. So numerous were these winged fugitives from the bleak north that they darkened the air like a cloud, and their transit occupied several minutes. The weather-wise consider the circumstance a sure prognostic of a severe and protracted winter.—*Doncaster Gazette, Jan.* 19.

Famished Wolves.—In many parts of France, the Wolves, driven by the extremity of the cold to ravage the cultivated districts, had become so numerous and so daring, that the hunting of that animal had superseded the other field sports.—*French Papers*.

Wild Ducks affected by the Severity of the Weather.—On Sunday, Jan. 28, a number of young men met, near Stainborough Park, with several Wild Ducks which could not fly from the severity of the frost; they were therefore

* This bird was killed at Southport, and is in the museum of the Royal Institution.

† Surely this bird is not otherwise than abundant near Liverpool.—Ed.

easily secured.—*Doncaster Gazette*, *Feb.* 2. [We conceive that want of water, and not the severity of the frost, affected these birds.—Ed.]

Cabbage Butterfly abroad in February.—On the 3rd of February, during a severe frost, we noticed a specimen of the common Cabbage Butterfly (*Pontia brassicæ.*)—Ed.

Pheasants and Pheasant-hunting in Norfolk.—The Pheasant is very abundant in the several preserves in the counties of Norfolk and Suffolk, and is the cause of serious frays between the poachers and the gamekeepers. I consider the preserves a curse to these counties, as nothing tends to demoralize the poorer classes so much as holding out such tempting inducements for them to pursue these unlawful depredations. It is no unusual circumstance to see, in some of the extensive parks, several hundreds of these birds out feeding at the same time.—J. D. Salmon, *Godalming*, *Surrey*, *Dec.* 23, 1837.

Frozen Otter.—On Saturday week (Jan. 20) Captain Maxey found a fine Otter frozen fast in the ice in the canal, and presented the specimen to the Swansea Institution.—*Doncaster Gazette*, *Feb.* 2.

Notes on *Tetracnemus diversicornis*, Westwood.—This insect is figured in the *Magazine of Natural History*, p. 258, with four branches to the antennæ. When I first saw it I thought it was the same as my *Ceraphron ramicornis* (Boehm. ?), being very similar, as far as antennæ go; but mine is more like Mr. Curtis's figure of *C. Halidayi*, but that has only three branches to the antennæ, and is scarcely more than half its size. I took my specimen on Knighton Heath, near Dorchester, Aug. 11, 1835, and Mr. Westwood's *T. diversicornis* on Oak, in Coombe Wood, July 3, 1835.—J. C. Dale, *Glanville's Wootton*, *Dorsetshire*, *July* 9, 1837.

Capture of the Eagle Owl (*Strix bubo*) off Flamborough Head.—A specimen of this rare British bird was captured off that celebrated headland Flamborough Head, after alighting upon the mast of a sloop sailing by, and was with difficulty secured, after it had actually pinned down with its powerful talons the cabin boy, who had been sent aloft to seize it.—Patrick Hawkridge, *Scarborough*, *Aug.* 7, 1837.

Birds observed near Doncaster during the Frost.—* * * But than these rarer objects have presented themselves to the notice of the lover of Ornithology. Many of them have fallen before the deadly tube of the gunner; but all of them have been observed in this neighbourhood:—The Bittern, the Dun Diver, the Goosander, the Smew, the Green Sandpiper, the Tufted Duck, the Pochard, the Scaup Duck, the Shieldrake, the Crossbill, the Crested Grebe, the Barnacle Goose, the Sanderling, the Royston or Norway Crow, &c. A pied Partridge has also been shot; and a few days ago four white Swans were seen passing over Balby, by Mr. Crawshaw, of Warmsworth.—*Doncaster Gazette*, *Feb.* 2.

Organ of the Communication of Ideas in Man.—Dr. Elliotson suggests, in the second part of his *Physiology*, just published, that there may be a new organ, the function of which is to communicate ideas. Phrenologists have hitherto been accustomed to attribute taciturnity to a large development of Secretiveness, combined with ample Caution, and communitiveness, on the contrary, to these organs being small. We, however, feel convinced that these qualities depend upon a separate faculty, named for the present Communication of Ideas. The fact of many persons having Secretiveness very large and yet being communicative to a remarkable degree, and *vice versâ*, indeed, clearly proves that Secretiveness is a much less active agent in the matter than commonly supposed. Some individuals are wholly unable to keep any idea whatever to themselves, and are instinctively and most powerfully impelled to communicate every trifling circumstance they hear to any person with whom they meet, whether or not the circumstances imparted are likely to be of interest to the friend thus instructed. This is the abuse of the faculty, which, uncontrolled, frequently leads to unpleasant, and not seldom to serious consequences. The same organ occasions the well-known proneness to gossiping amongst women of all classes, which we had before been unable to explain upon phrenological principles.

The locality of the faculty is not yet known, but it is an intellectual organ, and will probably range near Language.—Ed.

Hybrids between a Lion and a Tiger.—At page 489 of your Magazine the Rev. F. O. Morris notices that a specimen of a Lion-Tiger is preserved in the museum of Mr. Reid, of Doncaster; and as many of your readers may not be aware that the Lion and Tiger breed together so frequently as they do, I send you the following account, for insertion in *The Naturalist.*

Mr. Atkins, proprietor of the Liverpool Zoological Gardens, bred the first litter of Lion-Tigers at Windsor in 1824, and it is, perhaps, a fact worth mentioning that this brood was brought up by a terrier bitch, as the tigress did not evince the slightest affection for her progeny. They died when about a year old.

A second litter was born on Clapham Common, in 1824, but lived only a short time. In this instance, as well as the following, the tigress took to her progeny and suckled them; a third litter was born at Edinburgh in 1826, consisting of one male and two females. A fourth at Windsor in 1828, consisting also of one male and two females; a fifth at Kensington in 1831; and the last litter was born in the Liverpool Zoological Gardens in 1833, consisting of two males and one female. One of the males has since died, but the other two are still alive, and apparently very healthy.

The Gardens contain a very fine specimen of the Chetah or Hunting-leopard, which is, I believe, the only specimen alive in this country; also a specimen of the Indian Rhinoceros, which is rarely seen alive in England. It is said to

have cost Mr. Atkins £1,000.—T. B. Hall, *Woodside, near Liverpool, Feb.* 1, 1838.

Mode of Killing Insects.—Mr. Dale, in his "Hints" (p. 81), has omitted mentioning Mr. Haworth's plan for killing large Moths, which I think deserves to be known and practised. "When large Moths must be killed," says Mr. H., "destroy them at once by the insertion of a strong red-hot needle into the thickest parts, beginning in front of the thorax. If this be properly done, instead of lingering through several days, they are dead in an instant."—Peter Rylands, *Bewsey House, Warrington, Feb.* 3, 1838.

Curious Locality for the Hedge Accentor's Nest.—Most authors agree that the place this bird selects for building is a compact hedge. As a departure from the common rule, it may be mentioned that in the early part of spring, 1836, a pair of these birds built, and hatched their young, in a Fuchsia in Dr. Murray's garden, at Belle-Vue.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

The Veneer, Vanear, or Finear (*Crambus*).—A variety of *C. argyreus* (?), Glanville's Wootton, Enborne, Berkshire, and Hurne, Hampshire, May 18 to July 9. Mr. Haworth mentioned in his letter 13 that he had added quite a new Fineer (qu. *C. deceptor?* Bentley's Cabinet) from Norfolk (Beachamwell?), taken June 1823, by H. Scales, Esq.—J. C. Dale, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

On preserving Objects of Natural History in Spirits of Wine.—The following will be found an excellent preparation for covering over the corks of bottles in which the objects are preserved, and will effectually prevent the evaporation of the spirit :—

Common resin.
Red ochre, well pulverised.
Yellow wax.
Oil of turpentine.

The quantities of resin and oxide of iron, or of oil of turpentine and wax, must be regulated according to the degree of brittleness or elasticity that is required. The wax and resin must be first melted, and the ochre added in small quantities, at each addition being briskly stirred with a spatula; when this mixture has boiled seven or eight minutes, the oil of turpentine may be added, well stirring it, and the whole boiled for a short period longer. It is necessary to be very careful that these substances do not take fire, and in case they do, it is as well to be provided with a lid to cover the vessel and extinguish the flame. The quality of the luting can be ascertained by putting a little from time to time upon a cold plate, by which means its degree of tenacity is easily ascertained.

After having carefully corked the bottles, and wiped them well with a dry

cloth, the cement must be heated to the boiling point, and well stirred. The best mode of applying it is with a piece of old linen fastened to the end of a stick. Sometimes the luting, by penetrating the cork, makes the spirit of wine evaporate and burst the surface; this forms small openings, which are stopped by passing a second coat of luting over the first, having previously allowed it to cool. If the phials are small, their necks may be plunged into the luting, and by repeating the process two or three times it acquires the proper degree of thickness. From what little experience I have had, I find that a mixture of half water and half spirit answers the purpose equally well, and I have been told that a mixture of salt and water will suffice, and it is of course much more economical.—T. B. Hall, *Woodside, Liverpool, Feb.* 1, 1838.

Occurrence of *Apis mellifica* on Dec. 31.—On the last day of the year 1837 a Bee flew very briskly by me, which must have been at a considerable distance from its hive. The weather was beautifully fine, and the thermometer in the shade stood at 46°.—Peter Rylands, *Bewsey House, Warrington, Feb.* 3, 1838.

The European Goatsucker (*Caprimulgus Europæus*) near the Sea-coast.—This bird is found upon the moors in the neighbourhood, and is occasionally seen in the evening hawking for food in sheltered situations near the sea-coast.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

Helobia brevicollis, var. *Portlandica*.—Every specimen I take in Portland is much narrower across the thorax than those I take here, and I think it is as good a species as *H. Marshallana*, being apparently intermediate between that and *H. brevicollis*, but I am inclined to think that all the *Helobiæ* are but one species, varying from locality and other circumstances.—J. C. Dale, *Glanville's Wootton, Dorsetshire, July* 7, 1837.

Crambus lamellus.—Norfolk, Rev. J. Burrell, Parley Heath, West Hume, Ramsdown, Catherine Hill, Christ-church Head, and New Forest, in very fine order, from Aug. 14 to Sept. 6.—J. C. Dale, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

The Common Seal (*Phoca vitulina*, Linn.).—Pennant, in his *British Zoology*, mentions the occurrence of this species on the coasts of Caernarvonshire and Anglesea. The fishermen also have several times informed me of its occurrence. I have never, however, succeeded in obtaining or seeing one. Mr. Bell, in his *History of British Quadrupeds*, p. 263, mentions, on the authority of Prof. Nilsson, that the oblique position of the teeth is a constant character in this species. It is, however, one which appears to vary with the age of the animal. In the cranium of a specimen in my collection, obtained in Scotland, and of whose habits, when alive, some account was published in the first number of this Magazine, the two posterior molars are not oblique, and the third only slightly so. The fourth and fifth are, however, as represented in Mr. Bell's work, p. 268.

The teeth in the lower jaw correspond with those of the upper, although a young one, which appears from the state of the ossification, and the total length being only three feet four inches. It has no remains of milk teeth. The following particulars with regard to the skeleton may perhaps contribute towards the elucidation of the genus. The palatine bones are as figured by Mr. Bell. Vertebræ, cervical 7; dorsal 15; sacral 6; caudal 8; the tip of the tail was slightly injured, but I believe the enumeration to be correct.—T. C. Eyton, Esq., *in the Magazine of Zoology and Botany for February*, 1838, *No. xii., Vol. II. p.* 541.

Substitute for Cork Lining in Entomological Cabinets.—Having forwarded the receipt communicated to you by Mr. Morris, to a very excellent entomologist of Liverpool, A. Melly, Esq., for the purpose of asking his opinion respecting it, he states that he has always been in the habit of using composition instead of cork, and that he finds it not only cheaper, but quite equal to cork, and that on the Continent the plan is generally adopted. The one he employs is much harder, and is composed of two-thirds of the best Bees-wax and one-third of the best resin; but he observes that, in this climate, the addition of tallow cannot do much harm, and will save something in the cost; the great point is to melt it well, and to pass the resin through a sieve before the wax is added. The same gentleman has the best cases for insects that I have ever seen, and they are very reasonable in price. They are made by Messrs. Gillow & Co., of Lancaster, who, I believe, have an excellent name both for cases and cabinets. In Liverpool some collectors are in the habit of using prepared turf for the lining of cases, but from the experience that I have had of it, I do not like it at all. It comes cheaper than cork, but is far inferior to cork or wax.—T. B. Hall, *Woodside, Liverpool, Jan.* 26, 1838.

Carabus agrestis, *C. hortensis*, and *C. nemoralis*.—Weaver writes to me that a Mr. Walker had taken six specimens of *Carabus agrestis* in a Corn-field in the north of England. In the Linnæan Cabinet *Carabus hortensis* and *C. nemoralis* are mixed up as one species.—J. C. Dale, *Glanville's Wootton, Dorsetshire, May* 15, 1837.

The Natterjack.—The Rev. Leonard Jenyns, in his excellent *Manual of British Vertebrated Animals*, gives a very good description of this animal, under the name of *Bufo calamita*, Laurent. Among other particulars he states, that it was first observed near Revesby Abbey, Lincolnshire, by the late Sir Joseph Banks. It has since been met with in plenty on many of the heaths about London, as well as on Gamlingay Heath, Cambridgeshire, and in two or three localities in Norfolk. It is of much more rare occurrence than the Common Toad, and its pace is a kind of shuffling run. It spawns later in the season, and appears to affect dry sandy districts.—T. B. Hall, *Woodside, Liverpool, Jan.* 26, 1837.

The Siskin (*Carduelis spinus*) near Scarborough.—Several specimens were procured from a small flock found in the plantation at Barrow Cliff; and some others in the Fir plantation leading from the Mill Cottage to the Bridlington-road.—Patrick Hawkridge, *Scarborough*, *Aug.* 7, 1837.

Sayings and Doings of Skaters.—We have had more skating than even Mr. Murphy gave us reason to expect, and more, in fact, than is often obtained in this country. Consequently persons who had never before been on the ice in their lives now flock to the frozen lakes and meres in all directions, and scarce an old man or an urchin barely able to walk but has his daily slide, or his uncouth rusty skates. It is amusing to witness the infinite variety of these instruments, from the highly-finished guinea patent skates down to the blade of an old knife stuck into an equally rude piece of wood, and bound round the feet of the sturdy skaters with rotten straps, cordage, or other delectable contrivances. If the implements are thus diverse in character, of course so also are their wearers.

To such a degree has the "professional skater" become inured to his art or science—call it which you please—that he is out the first thing in the morning and the last at night. A "general observer" is all amazement at him, when he speaks of the *intense heat* of rooms icy cold to every one else, when he hears that his skating friend has been out eight or nine hours every day, when an exercise of four or five hours in the twenty-four constitutes with him a "*day of rest*," when the skater not only dreams of his craft at night, but almost fancies himself skating across the carpet in broad day-light, and when, finally, he declares that he can scarcely keep on his legs save when perched upon his darling skates.

Such are the feelings of this "active animal." We know we have many zealous skaters amongst our readers, in various parts of the kingdom. May they, each and all, live to skate many a day and many a year as in 1838 !—Ed.

BOTANY.

Species of Nuts indigenous to Britain.—At p. 169 of the second volume of *The Naturalist* the Rev. F. O. Morris has a query respecting the British species of Nuts indigenous to this country, and asks if the Filbert is not indigenous. The Common Hasel-nut of our hedges (*Corylus avellana*) is the only one enumerated in our Floras as indigenous in this country, but of this species in Loudon's *Hortus Britannicus* there are enumerated the following five varieties,—*alba*, *rubra*, *grandis*, *glomerata*, and *crispa*, which are natives of this country, and found in woods. There are four which are natives of Spain, viz., *Barcelonensis*, *variegata*, *ovata*, and *pumila*. There are also the following five additional species, *C. tubulosa*, native of the south of Europe; *C. Americana*, *C. humilis*, and *C. rostrata*, natives of North America, and *C. colurna*, from Constantinople. *C. mongolica* has been very lately discovered in Russia by

Professor LEDEBROS, near the Black Sea. In speaking on the subject to Mr. HENRY SHEPHERD, the present curator of the Liverpool Botanic Gardens, he states that some few years since, being in one of the alpine woods of Lancashire, at the time Nuts were ripe, he found one tree bearing fruit very much like the Filbert, both in shape, and also in its covering; the shell was also equally thin. Mr. SHEPHERD brought some of them home and planted them, and when he left that part of the country the trees were three feet high, since which period he has not seen them. The place is about fifteen miles north-east of Lancaster, in the parish of Tatham, near Longill.—T. B. HALL, *Woodside, Liverpool, Feb.* 1, 1838.

Clematis vitalba.—I can confirm Mr. HALL'S statement, at p. 27, of *Clematis vitalba* occurring in Essex; it grows in considerable abundance in the lanes near Saffron Walden. It seems to prefer a chalky soil, and I think I never saw it in such profusion as in the chalk districts near Fareham in Hampshire. Many of your readers may not be aware of the great variety of form the leaves of this plant assume, giving very different characters to the whole plant. Sometimes they are quite entire, without any appearance of dissection, while at others they are divided completely down to the mid-rib, and specimens are found in all the intermediate grades of development.—EDWIN LANKESTER, *Campsall, near Doncaster, Jan.* 12, 1838.

BLOOD RED WHEAT.—An instance of the prolific nature of the Wheat bearing this name has lately been produced, and is deserving of being placed on record amongst our agricultural memorandums. The produce of a piece of old cultivated land, belonging to Mr. WILLIAM COWLISHAW, of Carlton in Lindrick, *which barely measures one acre*, has been winnowed during the last week, and the result is 66 bushels of the best, and 3 bushels of hinder-ends—being somewhat more than 23 loads per acre! The best weighs 14 stone 2lbs., and is sold to Mr. BAXTER, of the Worksop steam mill, for 22*s.* 6*d.* per load. Many instances might be produced of the great yield of this Wheat (often confounded with the golden drop), exceeding that of almost any other—and the prejudices which existed against it in the minds of some millers, on its first introduction, are gradually on the decline. The price, as stated above, given by a well-known good judge, and careful buyer, is also an evidence that its quality is not inferior. We are indebted for its introduction into this neighbourhood to Mr. ST. JOHN CARTWRIGHT, of Worksop, who purchased it (being the prize Wheat) at one of the agricultural meetings in Scotland about three years ago.—*Doncaster Gazette, Feb.* 2.

COMMON BUTCHER-BROOM.—The leaf of the Common Butcher-broom (*Ruscus aculeatus*), late in autumn, presents a very curious appearance, all the fleshy parts of the leaf having been removed by the action of the rain upon it. The strong fibrous part, commonly called the nerves, alone remains. This is beauti-

fully arranged in elliptical lines, which inosculate with each other, that is, are joined by cross branches. These fibres appear to possess a good deal of strength, and might, I should think, if they are long enough, be put to some useful purpose. Whole stalks at a time present this net-like appearance.—BEVERLEY R. MORRIS, *Charmouth, Dorsetshire, Dec.* 17, 1837.

COMMON BUTCHER-BROOM.—In the neighbourhood of Godalming this beautiful evergreen, with its splendid scarlet berries, grows in the greatest profusion, on the slopes of the hills amongst the underwood, and it is only when in the shade that the berries come to the greatest perfection, for when exposed the plants scarcely bear fruit. In some of the specimens I gathered, almost every leaf was studded with its brilliant ruby berry. Is it not a little singular that the majority of our native plants which perfect their seed in winter, should bear scarlet berries?—J. D. SALMON, *Godalming, Surrey, Dec.* 23, 1837, *in a letter to Neville Wood, Esq.*

KOHL RABI.—A very fine specimen of this vegetable, weighing nearly 5 lb., was exhibited at the Black-Swan Inn, on Saturday last, by Mr. BLUCK, of Dinedor. A medical gentleman present stated that he had tested its qualities, and found it to contain a very large quantity of saccharine matter, and had no doubt of its nutritious properties, as food for cattle, Sheep, &c. Mr. BLUCK observed that it was a very hardy plant, heavier than the Swede Turnip, and seldom or never touched by the fly, and that, no doubt, if generally cultivated, would be found very profitable to the farmer.—*Hereford Times.*

NEW WOOD FOR LINING ENTOMOLOGICAL CASES.—I inclose you a small piece of wood which I procured from a friend who has a piece about two feet by one foot, and an inch thick. A gentleman of this town has all his entomological cases lined with this wood from Brazil. The ease with which the most slender pin comes out and enters is beautiful, and the substance would, if imported in sufficient quantity, do away with cork, wax, and all other lining.—T. B. HALL, *Woodside, Liverpool, Feb.* 7, 1838.

THE FUCHSIA.—Situated as we are on the eastern part of the island, and exposed to piercing cold winds, it may not be amiss to state the very great perfection the Fuchsia has been brought to in Dr. MURRAY's garden at Belle-Vue; many of them (standards) measure between four and five feet in height, and the principal stems of some are five inches in circumference.—PATRICK HAWKRIDGE, *Scarborough, Aug.* 7, 1837.

TOBACCO.—It appears, from the following account, that this "delicious weed" was deemed worthy of being praised so early as the time of ELIZABETH, about the middle of whose reign it was introduced by Sir F. DRAKE, who, "being instructed by the Indians, used it against crudities of the stomach, and certes since that time it is grown so frequent in use, and of such price, that many, nay

most, with an unsatiable desire do take it, drawing into their mouths the smoke therof, through a pipe made of earth, making the nose serve for an Indian chimney; some for wantonness, or rather fashion's sake; others for health's sake; insomuch that shops are set up in a greater number than either ale-houses or taverns."—*Annales of Elizabeth.* PAUL HENTZNER, who visited this country in 1598, confirms the above account, and concludes by observing that "they draw the smoke into their mouths, which they puff out again through their nostrils, like funnels!"—*Cheltenham Looker-On, Jan.* 20.

Clinopodium vulgare.—This is certainly not a common plant. I do not remember seeing it at Saffron Walden, in Essex, nor have I met with it at Campsall, or in the neighbourhood of that place. I make no doubt of its existence in both these localities, but it is not plentiful.—EDWIN LANKESTER, *Campsall, near Doncaster, Jan.* 12, 1838.

GEOLOGY.

THE PRINCIPAL WORKS ON GEOLOGY.—Your correspondent Mr. TATUM has inquired (Vol. II., p. 481), what are the best works on Geology? As this question has not been answered, perhaps I may be allowed to refer him to a list of works on the subject of Geology in Professor PHILLIPS's *Guide* to that science. If any of your contributors who are competent to the task would take that list and make a few remarks on those works which it would be most desirable for the student to possess, I am sure it would be acceptable to many of your readers. As the list stands in PHILLIPS's work, it is of but little use to a beginner.—EDWIN LANKESTER, *Campsall, near Doncaster, Jan.* 12, 1838.

REVIEWS OF NEW PUBLICATIONS.

The Weather Almanac for the Year 1838. By P. MURPHY, Esq., M.N.S. London: *Whittaker & Co.* 43rd edit.

ALTHOUGH Meteorology is not included in the objects of *The Naturalist*, as specified in the title-page, yet the amazing sale of Mr. MURPHY's Almanac, and the great importance of his discovery, if true, to the human portion of the animal kingdom, will, we think, justify the introduction of the subject at this time. The doors of Messrs. WHITTAKER & Co.'s house have latterly been guarded by armed men, editions of the work have been sold off in a few minutes, and two or three batches printed in a single day. Supposing that the fiftieth edition has been

reached by the 1st of March, and that each edition consists of 5,000 copies, the gross income from those fifty editions will amount to £18,750. Such being the state of affairs, it is not, of course, to be expected that the work should be forwarded for review, and we shall, therefore, like the rest of our editorial brethren, in this case notice a purchased copy.

Judging by the sale of this almanac, the majority of the public must place almost implicit reliance on Mr. MURPHY'S prognosticating powers, and many, we know, are determined to make him right at all events, while others, on the contrary, ridicule his pretentions altogether, and charge him with *guessing*, &c. The first class we have shown to be exceedingly numerous, the second and third very much less so, while those who candidly and impartially investigate the accuracy of the Almanac are indeed few. The only paper or periodical known to us which can be placed in this fourth division, is the *Cheltenham Looker-On*, a weekly paper which often contains articles of considerable interest. Mr. Moss, of Cheltenham, is now in course of testing Mr. MURPHY'S anticipations, placing these and the actual state of the weather in juxta-position.

That Mr. MURPHY has always been right from the 1st of January up to this time (Feb. 16), we are not prepared either to prove or to admit; but we think it must be clear to every impartial and reasoning mind,—1st., that the weather is governed by certain fixed laws; 2nd, that these laws are not beyond human ken; and 3rd, that Mr. MURPHY has in part discovered those principles. Be it, however, observed that a single error is not to be supposed to militate against these three positions; on the contrary, to us the exceptions prove either, 4thly, that Mr. MURPHY is not in possession of the entire secret, or, 5thly, that accurate predications of an extensive tract of country cannot be attained by observations in a single spot. We say accurate, because doubtless the *general course* of the weather may be prophesied for the whole of Britain by observations in a given spot, but the rain, the snow, the frost, or the calm, may arrive a day later or sooner according to the variations of locality, surface, &c. While, then, these apparent errors, without pointing out either the impossibility of predicating the weather at all, or the entire accuracy of Mr. MURPHY, only prove, what every one knows, that rain does not descend exactly at the same time over the whole country.

Our weather-prophet succeeded in January in a most remarkable manner. His anticipations of the thaws and frosts were fulfilled, and, what is more, after the intensely cold night of the 20th ("*Probably the lowest degree of temperature.*" —MURPHY), when there was every likelihood of a long-continued frost, Mr. M. promised that it would be "*changeable*," as actually proved to be the case. He has occasionally erred in his prognostication of "wind and rain," but never, we believe, in that of "fair" weather.

If report may be credited, our author's predications for 1837 proved egregiously incorrect, and doubtless time will still further perfect his system and the usefulness of his almanac in future years.

Mr. MURPHY, however, is not the only weather-wise prophet in the field, but he is certainly, and justly, "the favourite." Lieutenant MORRISON, of Cheltenham (or "ZADKIEL," as he styles himself), and the author of the *Howden Almanac* have aspired to similar honours, though apparently with less success. Nevertheless we have no desire whatever to check inquiry into the matter, believing, as we do, that the only satisfactory mode of predicating the weather in Britain throughout the year, will be to publish a weather almanac purposely and solely for each district. For the present, however, all thoughts centre in *The Weather Almanac* before us, and the comparison of its statements and the actual state of the weather during the spring and summer months, will be matter of the most lively interest to hundreds and thousands of individuals in this fair realm. In the mean while let us wish success and long life to PATRICK MURPHY, Esq., M.N.S.

A History of British Birds. Illustrated by a Wood-cut of each Species, and numerous Vignettes. By WILLIAM YARRELL, F.L.S., Sec. Z.S. London: *John Van Voorst*, Paternoster-Row. Part iv. Jan. 1, 1838.

THIS number contains Tengmalm's Owl, the Shrikes, the Flycatchers, the Dipper, and the Thrushes.—Most of the figures are finely and faithfully executed, but we do not admire that of the Gray Flycatcher. In his description of the Dipper, our author has the following remark:—"Never having seen this bird alive, I must be indebted to the recorded observations of those who have; and one of the most complete and perfect accounts that I am acquainted with is that by Mr. MACGILLIVRAY, published in the first volume of *The Naturalist*, p. 105." A drawing of a nest of the same bird, transmitted to the author by our correspondent, Mr. J. D. SALMON, is supplied at the close of the biography.

From the account of the Missel Thrush we make the following extract:—

"The Missel Thrush is one of the largest of the British species of Thrush, and though not very numerous any where, is yet very generally diffused, as its range in this country, to be hereafter quoted, will evince. It is rather a shy bird, frequenting small woods, and the high trees in hedges bounding large meadows; but during the breeding-season it becomes bold and quarrelsome, driving away the smaller birds in all directions from its haunts, so much so as in Wales, according to PENNANT, to have acquired the name of *Penn y llwyn*, or master of the coppice. It is resident in this country all the year, and the male commences his song very early in the season, sometimes in February.* His strain, which is something like that of the Blackbird, but not so good in quality of tone, is

* We have heard him on the 1st. of January.—ED.

epeated many times in succession, and generally from the top of some lofty Oak, Beech, or Fir tree; but he has been occasionally observed to sing while on the wing, and from a habit of giving his song both before and during the occurrence of wind and rain, the name of Storm-cock is a well-known appellation for the Missel Thrush. It is also called the Holm Thrush, probably owing to its partiality to the Oak, from the top of which this Thrush will sometimes continue to repeat its song for an hour together, and occasionally also has its nest in the Oak—

"'The fruitful Olive, and the Platane round;
The carver Holm *; the Maple seldom inward sound.——SPENSER.

"A good botanist has reminded me that the red berries borne by the plant named Butcher's-broom, *Ruscus aculeatus*, which grows on bushy commons, are called Holm-berries; and as the Missel Thrush is a decided feeder on berries generally, it may have acquired the name of Holm Thrush from feeding on the Holm-berry."—p. 181.

This work proceeds very successfully in every respect.

British Oology; being Illustrations of the Eggs of British Birds, with Figures of each Species, as far as practicable, drawn and coloured from Nature: accompanied by Descriptions of the Materials and Situation of their Nests, Number of Eggs, &c. By WILLIAM C. HEWITSON. Newcastle-upon-Tyne: Published for the Author, by *Currie and Bowman; W. Edwards*, London. No. xxxvi. Jan. 1, 1838. Royal 8vo.

THE first plate in this part is intended to be substituted for the before-published Plate cxix., some of the copies having been spoilt in colouring. The next plate contains an excellent figure of the egg of the Dotterel Plover (*Charadrius morinellus*). This bird was positively ascertained to breed in some of the higher districts of Cumberland, by Mr. HEYSHAM, in the summer of 1835, as related in the *Magazine of Zoology and Botany*, in a communication quoted by Mr. HEWITSON. The Dotterel, it appears, generally lays four eggs.

One illustration of that of the Avocet is faithfully represented. The ground-colour of some specimens in the collections of our correspondent, Mr. ALLIS, and of Mr. BAINES, said to belong to this bird, is nearly white, marked with small spots of dark brown and neutral tint. The colour termed "neutral tint" is a mixture of black, blue, and red (commonly Indian-ink, Prussian-blue, and lake), combined in a certain proportion.

The fine egg of the Great Auk (*Alca impennis*) is then figured. This bird has only once been met with on the British coast, and our author's drawing is from a specimen in the rich collection of Mr. YARRELL.

The egg of the Common Rotch (*Mergulus melanoleucos*) appears on the same plate. This bird breeds in the bleak and dreary polar regions, and is abundant

"* The Holm Oak, *Quercus ilex*."

on the shores of Greenland, "whence," says Mr. HEWITSON, "specimens are brought home by the sailors employed in the Whale fishery." The only egg seen by our author was obtained from one of the Greenland ships.

The egg of the Osprey (*Pandion haliœtus*) is beautifully figured on the next plate, as is also that of the Jer Falcon (*Falco Islandicus*). The former species frequently breeds in Scotland, and Mr. HEWITSON has received specimens from Sir WILLIAM JARDINE and Mr. YARRELL. Of the Jer Falcon our author observes:—

"Two eggs of this rare bird are in the collection of Mr. YARRELL, by whom they have been kindly forwarded to me. They are the only specimens I have heard of, with the exception of one in the museum at Leyden, a drawing of which was, with the greatest kindness, sent me by Professor TEMMINCK, through the instrumentality of Mr. HOY.

"The Jer Falcon breeds in rocks, in those countries which are rendered difficult of access from the severity of their climate.

"We were not so fortunate as to meet with it in Norway, although we were told that had time permitted, we might have done so, by penetrating, for some days' journey, into that part of the country which was covered with snow."

The *British Oology* will close with the next number, with a complete list of subscribers. Those who desire to include their names in this list will therefore do well to forward them without delay. We trust Mr. HEWITSON will in time collect a sufficient number of the eggs of rare birds to induce him to publish a supplementary part.

The British and Foreign Medical Review; a Quarterly Journal of Practical Medicine and Surgery. Edited by JOHN FORBES, M.D.,F.R.S., and JOHN CONOLLY, M.D., &c. No. ix. Jan. 1838. London: *John Churchill*, Princes-Street, Soho.

THIS ably-conducted and scientific journal frequently contains notices and reviews of interest to the zoologist and botanist. If we may be allowed to judge by the general appearance of the work, we should pronounce that it has attained the circulation its merits so well deserve. The subjects treated of in the number before us are exceedingly various.

LITERARY INTELLIGENCE.

Lately published, in LARDNER'S *Cabinet Cyclopœdia*, *Animals in Menageries*, by WILLIAM SWAINSON, Esq.

It is proposed in future to combine the *Magazine of Zoology and Botany* with the *Companion to the Botanical Magazine*, under the title of *Annals af Natural History*, to be issued monthly. The conductors state that they cannot speak

highly of the support they have received from naturalists, and, with every wish for their success, we consider it very questionable whether the work will pay its expenses in its new form. We have always felt a pleasure in recommending this periodical to our readers, and in impartially pointing out its merits and defects, even while told that it was a rival, and ought to be treated as such. Has the conduct of the Editors of the *Mag. Zool. and Bot.* been equally ingenuous towards cotemporary publications? We regret to believe that it has not.

OBITUARY.

Died, at Stapleford, Herts., Dec. 28, 1837, Mr. William Griffin, aged 85. He was for 22 years gardener to the late Samuel Smith, Esq., of Woodhall, in this county; and author of a *Treatise on the Pine-apple;* also a paper "On the Management of Grapes in Vineries," published in the *Horticultural Transactions*, Vol. I., p. 98. He was a native of Leicestershire, in which county he commenced business; and after filling various situations in that and the neighbouring counties, with the greatest credit to himself and satisfaction to his employers, he arrived at Woodhall, where I first became acquainted with him; and, by practising under his direction for some time, I found in him the real man of business, and one who acted the part of a father and friend to all the young men who, like myself, had the good fortune to receive a part of their instruction from him. I believe him to have been a first-rate horticulturist of his day; and, up to the last day of his practice, his anxiety was as great as ever; although his faculties had become somewhat impaired, and consequently business was not carried on with the same degree of succes as formerly. He had retired to the village above mentioned about four years before his death, which was occasioned by a fall in his bed-room, which brought on inflammation, and which, in eight days, put a period to his sufferings. He has left an only daughter to lament his loss.—*Correspondent of the Gardener's Magazine for February.*

On Friday last, at Scrooby, Mr. George Shepherd, aged 76 years. He was highly respected by his employers, having with fidelity served in the capacity of head gardener for nearly twenty years respectively in the families of the late Viscount Galway, of Serlby Hall, and the late H. T. Mellish, Esq., of Blyth Hall, near Bawtry.—*Doncaster Gazette, Feb.* 16.

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THE NATURALIST.

ON THE GEOGRAPHICAL DISTRIBUTION OF BIRDS.

DELIVERED BEFORE THE MEMBERS OF THE ORNITHOLOGICAL SOCIETY OF LONDON.

THE Monthly General Meeting of this Society was held on Friday, Feb. 2, J. R. GOWEN, Esq., in the chair.—The attendance, notwithstaanding the severity of the weather, was more numerous than on any former occasion. A great number of ladies occupied the front seats.

The Report of thc Council stated that Mr. BLYTH had been appointed Assistant-Secretary and Curator of the Museum, the latter office being rendered necessary by the munificent loan of the Hon. W. T. FIENNES. Several donations were announced: among them was a collection of anatomical preparations, presented by Mr. BARTLETT. It was stated that the collection of living birds in St. James's Park had sustained very little injury from the severity of the weather, and that arrangements had been made for procuring a great number of rare and beautiful species in the course of the ensuing spring.

Professor BELL, ROBERT BLAGDEN HALL, Esq., M.P., and ANTHONY WHITE, M.D., were elected members of the Society.

The report having been approved, the Chairman called upon Mr. BLYTH to open the discussion of the day, on "The geographical distribution of Birds."

Mr. BLYTH then came forward and delivered an elaborate discourse on the geographical distribution of birds, pointing out how a variety of groups, as well as species, are altogether confined to particular regions, whereas other groups, and some of comparatively trivial value, are diffused over the greater portion of the world. The important revolutions which, in the course of ages, have gradually taken place in every locality, not only as regards the succession of inhabitant species, but also, in many instances, in the types of form on which these have been respectively modified, were descanted on at considerable length: exemplifications of some of the more prominent of these changes being necessarily, however, adduced from other departments of Natural History; as the known fossil remains of birds are proportionally extremely few, sufficient merely to awaken curiosity, without leading to any special conclusions; the reliques of this class of animals being, for obvious reasons, much less liable to become entombed in deposits, than those of the other divisions of *Vertebrata*. Taking the "vertical series," however, as it is termed, or the succession of races which inhabited the same locality during different eras, and what is known as the "horizontal

series," or the cotemporaneous habitants of diverse regions, Mr. BLYTH regarded the respective distribution of types of form as strictly analogous; and contended that neither in the one case nor in the other was it possible to deduce universal laws, though of course it was highly necessary for the naturalist to possess a general knowledge of the vast accumulation of facts that had been elicited on the subject, if only that he might be effectually guarded against any delusory hypothesis, which a too hasty or insufficiently extensive generalization might otherwise lead him to fall into. A number of instances were then brought forward of types peculiar to certain eras, just as, at the present time, we find that others are confined to particular regions; the location of which latter, however, was shown in some instances to be of comparatively recent date, species framed upon them having formerly been diffused over a more extensive area; while in other instances it would seem that the geographical limitation has remained the same from a very remote period, if not from the time of their original introduction, of which the Kangaroos of Australia, and Lamas of South America, afforded illustrative examples. Cases were also adduced of groups of species, modified upon particular types of structure, to perform an especial office in the economy of Nature, which office, at another period of the earth's history, appears to have been fulfilled by other groups, modified upon very different types of structure; precisely as, at the present time, the Humming-birds, which are peculiar to America, are represented, in the tropical and southern regions of the old Continent and its islands, by analogous groups of nectar-feeding birds, of which the rudimental anatomy is widely dissimilar. It was thus that the *Cetacea*, though possessing all the essential characters of Mammalians, are modified to pass their lives after the manner of fishes: on the same principle, again, that corresponding groups in the different classes are observed, the part allotted to which in the grand scheme of the universe is absolutely the same.

Mr. BLYTH then proceeded to explain the important difference subsisting between what he designated the *rudimentary* and *adaptive*, or the intrinsical, as opposed to the superficial, characters of organized races; the former of which he affirmed to imply *affinity*, or physiological proximity, the latter merely what is understood by the term *analogy*. He decidedly opposed the popular theory of universal gradation (which supposes a concatenation of intermediate races, in which the *rudimentary* characters of distinct types are blended), however outward appearances might sometimes favour such a notion: the Rain-fowl (*Scythrops*) of New Holland, for instance, had been deemed a connecting link between the Toucans and the Cuckoos; but the Toucans and Cuckoos differ materially in the form of the skeleton, and in other details of their anatomy; and *Scythrops*, Mr. BLYTH asserted, is in every essential particular a true Cuckoo, with merely a larger bill than usual, this very superficial character constituting

its sole resemblance to the group of Toucans. In Nature, Mr. B. contended, we are presented with a succession of mutually distinct groups, rather than a continuous series; with successively subordinate types of form, of every degree of value and of mutual affinity, on each of which may be framed an indefinite number of species, variously modified to suit any particular mode of life; the *adaptive* characters, however, consequent on such modification by no means affecting their intrinsical or physiological systematic relations. He was of opinion that the most approximate modifications of distinct types are not more nearly related by *affinity*, than are the more characteristic representatives of the same; while, on the other hand, the most dissimilar modifications of the same possessed a higher degree of mutual affinity than either could have for any outwardly resembling species modified upon any other type. The group of Raptorial birds was cited in illustration, as comprising two principal subordinate types, distinguished constantly by strongly marked differences in the structure of the skeleton and digestive organs; and not the slightest trace of a gradation, or transition, in these *rudimentary* characters was stated to be observable, either in the most Owl-like Hawks or the most Hawk-like Owls, however in their superficial or merely *adaptive* characters they may reciprocally approximate. In like manner, to descend another grade, the Osprey was represented as being organized on a distinct minor type to that on which the rest of the European *Falconidæ* are alike framed; and although it had been customary to regard the peculiarities of that genus as simply *adaptive*, yet it remained to be shewn, that any gradation towards those peculiarities is exhibited; for the Ernes, or Sea-eagles (*Haliæetus*), which subsist to a considerable extent on similar food, were described to be as widely separated in their internal structure from the Ospreys, as are the Hawks and Falcons. Pluck forth a single feather even, it was added, from an Osprey, and a corresponding one from an Erne, and their comparative structure will be found to corroborate strongly what has just been advanced.

It was the especial province of the zoologist to distinguish, in every instance, the intrinsical from the simply adaptive characters of animals; to disentangle and discriminate affinity from analogy; to cease confounding those superficial resemblances which still induced the vulgar to style the Whale a fish, with those far more important and rudimentary characters on which the true station of that animal had been determined by naturalists. In Ornithology, Mr. Blyth regretted, too little attention had been paid to those more essential distinctions on which only a sound and permanent classification can be founded; and it was this that rendered it necessary for him to digress to enter into the foregoing details, on the present occasion, in order to explain what he meant by asserting that particular types of form were represented only in certain regions, or during especial periods of time: otherwise, it was added, the statement that the Toucans

are entirely confined to South America, might be met with the fallacious remark, that the nearly allied *Scythrops* existed in Australia, and *Phœnicophæus* in Africa; neither of which, Mr. Blyth asserted, manifested any especial relationship to the group in question, except in extremely superficial characters. It was amusing to listen to the complaints of some who held that Anatomy was invading the province of Zoology proper; as if it were not more likely to lead to just conclusions to comprehend the whole than a part; but the knowledge of the entire structure of animals sometimes sapped the foundations of systems based solely upon *adaptive* characters, and hence the obnoxiousness of investigations carried below the surface. He trusted that the Ornithological Society would exert their energies to procure actual birds for their museum, in addition to the mere husks on which so many applied their exclusive attention; not that he wished to undervalue distinctions derived from the mere exterior, when no opportunity occurred of penetrating deeper; but he could only regard the position assigned to any isolated group as provisional, until information had been obtained relative to the principal details of structure.

Mr. Blyth then adverted to the attempts which have been recently made to divide the world into what have been designated "zoological provinces," or regions severally characterised by peculiarities in the aggregate amount of their respective faunas; and proceeded to comment more especially on that of Dr. Richardson, who, while justly regarding South America, which possesses so many peculiar forms, as constituting an extremely distinct zoological province, considers Europe and North America as composing one only, the animals of these regions being mostly framed on the same generic types. He stated, as a highly curious fact, which he was unaware had been remarked previously, that those North American birds which possess no European generic representative (as the numerous group of Tyrant-flycatchers, the *Sylvicolæ*, &c.), and also those European races which belong to genera that contain no species proper to America (as the group of small Dentirostral birds proper to this region, together with the Oriole, Roller, Bee-eater, Hoopoe, and others), were almost without exception *migratory*, appertaining to types especially and prominently characteristic of those countries to which they retire in winter: which circumstance was adduced as possibly indicating that the aboriginal habitat of migrant races was their winter abode, rather than their breeding station; whence, contrary to what might have been expected, they should perhaps be regarded as more strictly belonging to the fauna of the former, being accounted as seasonal visitors only where they rear their broods. It was further remarked, that several migratory races visit countries both northward and southward of the equator, though restricted to a narrow meridional range; whereas stationary species are commonly confined within certain parallels of latitude, their distribution extending eastward and westward,

or rather, according to the range of a particular climate. Several European birds are thus met with at a particular altitude on the mountains of India, and thence onward to China and Japan; and, indeed, the European types of form are so prevalent in those regions, though gradually mingling, of course, on the southern confines, with others proper to the adjacent countries, that there appears to be no reason why the entire circuit, northward of about the 30° parallel, might not be included as a single zoological region, on the same principle that North America and Europe have been so ranged. We know but little, at present, of the animal inhabitants of the extreme eastern portion of Asia, though it is probable that their general character does not differ materially from that of the races which inhabit the opposite coast of America; in some instances, indeed, we find North-American forms extending even to the mountains of India; as is exemplified by the existence of a Blue Jay (pertaining to the division *Cyanurus*, SWAINSON) in the Himmalayas, all the other species of which group are exclusively natives of North America.

Attention was next called to the Ornithology of the southern hemisphere, which was stated to be considerably more tropical in its general character than that of corresponding latitudes of the northern: this was especially shewn by the much greater proportion of frugivorous and nectar-feeding species, among which the Parrot family bore a conspicuous station. Several forms, as the Penguins, were indicated as peculiar to that hemisphere; and instances of congenerous species adduced as inhabiting South Africa and New Holland; while that extraordinary and gigantic Dentirostral bird, the Australian *Menura*, found its nearest systematic relatives in the *Megapodii*, from the neighbourhood of Cape Horn. Of the intertropical genera, comparatively few were represented in both the Old world and the New; and many were confined to rather circumscribed localities. The Trogons, of which several species occurred both in South America and in the Oriental Isles, possessed, in each locality, certain discriminating characters, which were curiously combined in the only species known to inhabit Africa. It was affirmed that a multitudinous host of diversified facts might be enumerated, which, however, would not admit of being generalized into a definite system; and Mr. BLYTH accordingly proceeded to consider the laws which tend to regulate and limit the dispersion of particular species. He dwelt on the minute adaptation of each to its indigenous locality, removed from which it was little else than a disjointed fragment, and this in proportion to the exactness with which it was modified for any peculiar mode of obtaining subsistence; and he insisted much on the efficacy of what he denominated the "localizing principle," that which impels a Pigeon homeward from a distance of many hundred miles, a Bee towards its hive, and by means of which migratory species of birds revisit, both in winter and summer, the exact same haunts which they had formerly occupied; of which

fact a variety of surprising instances were detailed. It was on this principle, he stated, that colonies are sometimes formed, the posterity of an accidentally straggling pair remaining in or regularly returning to a neighbourhood, occasionally insulated, and remote from other haunts of the species; an exemplification of which he adduced from personal observation, and suggested that the limited and peculiar range of the Pied Flycatcher in England was in all probability thus explicable. He considered that the operation of the mysterious and remarkable instinct, which he had been dilating on, had been a great deal too much overlooked by those who have written on the subject of the dispersion of animals; although decidedly the most influential of the many causes which tend to circumscribe their geographical range. Mr. Blyth was heard throughout his discourse with the greatest attention, and received considerable applause at its termination.

N. A. Vigors, Esq., M.P., then rose, and having stated that he hoped this highly interesting and important subject would be followed into its subdivisions at ensuing meetings of the Society, proceeded to make a few remarks upon some of its more striking points—such as the correspondency, or geographical representation, of groups and of species inhabiting different localities; as, for example, the Ostrich, of the African deserts, which is represented in Asia and its islands by the Cassowary, in Australia by the Emeu, in the Pampas of South America by the Rhea, and in Europe, as he conceived, by the Great Bustard. It was his opinion, that every prominent group has thus an analogue, or representative, in each of the principal divisions of the world; or that, if in any case such representative be wanting, the deficiency is invariably occasioned by some adequate and equally harmonious cause. As an example, the Starling family was represented as inhabiting all parts of the world except Australia; the explanation of which exception is, that they seek their food principally on the backs of cattle, and in Australia there are no indigenous ruminant quadrupeds. It was thus that, in numerous instances, the diffusion of animals is regulated by that of their prey—this, again, by that of particular vegetables, which, in its turn, is dependent on the soil.—Before Mr. Vigors concluded, he expressed a hope that, at the next meeting, there would be laid on the table a greater number of specimens to illustrate the subject of discussion.

Mr. Chester stated, that if the gentlemen who proposed to favour the Society with any scientific observations at future meetings, would apprise the Council of the specimens which would be desirable for illustration, every possible exertion should be used to obtain them.

ON THE RELATIVE ADVANTAGES OF THE LINNÆAN AND NATURAL ARRANGEMENTS OF PLANTS.

By Edwin Lankester,
Member of the Royal College of Surgeons.

In your last number (p. 68) your talented contributor, Mr. Lees, has furnished a notice of botanical works, which I should have been glad to have found occupying the place of my brief communication in your December number (Vol. II., p. 470). I should not have troubled you with any remarks on Mr. Lees' paper but that he has asserted that the rejection of the Linnæan system is "unphilosophical," and that the reason of it appears to him to be "merely because in some respects it seems to offer greater facilities for tempting votaries to the temple of Flora." In making the remark I did, in my communication of December last, on the *Ladies' Botany*, I stated that Dr. Lindley discarded the artificial system as prejudicial to the science of Botany, and gave no opinion of my own on the subject; therefore Mr. Lees was premature in disagreeing with me on that point. As, however, many of your readers may wish to know why so competent a botanist as Dr. Lindley deems the Linnæan system prejudicial to the advancement of the science of Botany, I will endeavour to state a few objections to that system; and, whatever may be their force or value, I hope they will find the Doctor, and those who adopt his views, at least "not guilty" of the charge brought against them by Mr. Lees.

It cannot be supposed that Mr. Lees or any other botanist would deny the superiority of the natural over the artificial system in a scientific point of view. In every department of knowledge the value of a natural arrangement of its objects is acknowledged, and the most eminent naturalists have laboured to improve this department of science. The question at issue must then be, whether the adoption of the Linnæan system at all is injurious to the interests of Botany as a science?

In the first place, it must be admitted, that the general adoption of any system which excludes a better from being brought into use must be prejudicial to science. It is not certainly necessary that the natural system of Botany should be neglected because the Linnæan has been adopted, but unfortunately this is too often the case, and systems are frequently adopted and adhered to as matters of feeling and not as matters of judgment. Hence it is of importance to science that those commencing their career should not have their prejudices enlisted on the side of false theories or exploded systems, especially when the means of obtaining correct views are easily attainable.

By the study, also, of an artificial system the mind is apt to suppose itself

in possession of an extensive knowledge of the subject; and by the facility with which it has been acquired, it is unfitted or gets a distaste for the more thorough investigation that natural systems require. The former, Dr. Lindley observes, "skims only the surface of things, and leaves the student in the fancied possession of a sort of information which is easy enough to obtain, but which is of little value when acquired"; the latter, the same writer continues, "requires a minute investigation of every part and every property known to exist in plants, but when understood has conveyed to the mind a store of information of the utmost use to man in every station of life. Whatever the difficulties of becoming acquainted with plants according to this method, they are inseparable from Botany, which cannot be usefully studied without encountering them." Sir John Herschel quotes this passage in his *Discourse on Natural Philosophy*, and remarks that it "characterises justly the merits of natural and artificial systems of classification in general." The same author observes, with regard to the subject before us, that "the classifications by which science is *advanced* are widely different from those which serve as bases for *artificial* systems of nomenclature."

If, then, the natural system is the only mode by which the science of Botany can be advanced, and the adoption of the Linnæan system leads to its rejection, I think it is but a fair conclusion that the adoption of the Linnæan system is "prejudicial to the advancement of the science of Botany."

But the advocates of the Linnæan system say, that it is so easy, and the natural system so difficult, that whilst the one attracts, the other repels the student of Botany. The best argument that Sir W. J. Hooker offers for arranging his *British Flora* according to the Linnæan system, is that it enables the student to discover the name of a plant with more facility than the natural system. Now, undoubtedly, the acquiring the names of the classes and orders is much easier in the Linnæan, than the natural system; but I have no hesitation in saying, that a person who understands the distinctions of the classes and orders of the latter, will with much greater facility discover the genus and species of a plant than when he has attained the same amount of information in the former system. For in studying the orders of the natural system he will have made himself acquainted with many points of structure that are afterwards taken into consideration in the distinctions of genera and species. But how different is the case with the artificial system! when the classes and orders are understood little more than a knowledge of the stamens and pistils has been acquired, and this will help a student but a very small way towards finding the name of a plant. If the knowledge of the number of the pistils and stamens would enable the botanist to find the genus and species of a plant, it would indeed be an easy way of discovering its name; but as this is a very secondary department in Botany, such a plan could only be valued on this account, and even then its

practical application would not be much easier than the analytical tables of the French botanists.

But granting that the Linnæan system enables a person to find the name of a plant easier than the natural system; is this the ultimatum of the science of Botany? or is this the only delightful part of the study of Botany? that for the sake of it the system of LINNÆUS, although wholly inadequate to the purposes of science, must not be condemned? It may be pleasant to run about the hills and vales of our own islands, and find a name for every blade and tiny weed that springs beneath our feet; but is it not just as pleasant, or much more so, to walk into our gardens, nursery-grounds, or green-houses, and be able to know something of those provisions in the vegetable kingdom which the Creator has made for other parts of the world besides our own? By studying Botany on the natural system we may do this. We need not restrict our observations to plants indigenous to our own soil, but may look upon the vegetable world as a whole, and instead of learning the name and properties of a single plant, as by the Linnæan system, we may, with the same labour, ascertain the structure and properties of a group of plants, every individual of which may be recognised, from whatever part of the world it may come. Now, if the name, structure, and properties of a family of plants can be ascertained as easily by the natural system as the same particulars of an individual plant by the Linnæan, and this information is as interesting in the one case as in the other (the greater utility of the former cannot be doubted), on what grounds can the latter system be said to offer "greater facilities for tempting votaries to the temple of Flora?"

Another objection to the Linnæan system, is, that its advocates belong to a school whose views are very far behind the advance made by the science of Botany. Dr. LINDLEY observes, of the books written by them, that "the technical language in which these works are written is far from accurate; terms are applied in them vaguely and erroneously, and they so abound with mistakes, most of which are at variance with all correct notions of the structure of plants, that they are totally unfit to be placed in the hands of students." Now if these charges are true, and no one who makes the science of Botany a study can doubt it, it must be admitted, as a fair conclusion, that the system which lies under them is "prejudicial to the advancement of the science of Botany."

No doubt many of the books of Linnæan botanists are written in a pleasing style, and are calculated to allure to the study of Botany; but this arises from the authors of the works, and not from the system they are intended to explain. Till within the last few years these were the only books that could be put into the hands of a student, and before that time it was undoubtedly better that they should be studied than none at all. But now that we have books explaining the natural system, and adapted to the advanced state of the science, it is surely

better that these should be recommended, than those which contain erroneous views. Besides, if there have been any deficiency of books on the natural system, it has been for the want of demand, and by exciting attention to the subject we may expect to see volumes as interesting and as well adapted for learners on this system as on the Linnæan.

I have extended these remarks to a greater length then I originally intended; but I hope they will not be found longer than the interest or importance of the subject demands.

Campsall, near Doncaster,
February 19, 1838.

MANNERS AND CUSTOMS OF THE NEW ZEALANDERS.

By Thomas Kier Short, Esq.

(Continued from p. 66.)

The natives of New Zealand are fine, tall, and robust, generally superior in stature to the British, broad-chested and powerful, and their limbs as muscular and sinewy as if they had always been occupied in laborious employment. They are of a lighter colour than the American Indians, with good regular features, and a profusion of curly hair. They are shrewd, cunning, and sarcastic, and, where christianity is not known, dirty, thievish, and revengeful, and some horrible accounts are recorded of their disposition to cannibalism, murder, infanticide, and other crimes revolting to human nature.

Polygamy is maintained by the chiefs, and there is no government; slaves and gentlemen associate together without any distinction or respect. Their houses are low and mean, and the inhabitants nestle together more like a herd of Swine than human beings. In their rude native state they may be ranked among the most degraded of our species. I believe they scarcely ever cut or clean their hair (except chiefs), nor wash their garments, but some apparently wear them till they drop off or are worn out. They make a kind of square piece of what we call mats, of the fibre of *Phormyum tenax*, variously ornamented, according to their ideas, with bits of coloured worsted, when they can get it, and long strings of black, brown, and red of their own dying. This is fastened over their shoulders, and is all the covering they generally have. The women wear another kind of mat, which is fastened round their loins, and extends to their knees. When they sit they squat upon their heels and posteriors like Monkies, just letting their noses peer above their mats. The slaves (or, as the New Zea-

landers call them, "Kookes") cannot afford the above mats; they accordingly manufacture a covering of flax, which gives them the appearance of having their backs thatched; one end of the flax is secured in a band of wove matting, the other hanging down twelve or sixteen inches, and forming a secure covering against the rain: this they call a Kokoho.

They are subject to many diseases, induced by their bad mode of living; consumption is very prevalent among them, but the most destructive is a species of venereal which is hereditary in many families, and a virulent kind of itch, which if not dangerous, is very infectious, especially among Europeans.

Some have represented them as being virtuous and happy in the native state, but the missionaries have had to dispel ignorance of the blackest and darkest kind. He has had to assault systems which have descended from generation to generation, most revolting to humanity, a depravity grown inveterate by ages of continued and unrestrained iniquity.

When Cook first landed, some unhappy quarrels with the natives occasioned the shedding of much blood on both sides, and for years caused the island of New Zealand to be looked upon with horror by Europeans. Even the natives of the unfrequented island of Tucopee are acquainted with their savage acts of cannibalism. Since Cook's visit the habits of these people have undergone a great change; then it was requisite, when a vessel anchored, that the boarding netting should be up and all on the alert, in case of surprise. Their principle was to make the captains of the vessels believe themselves secure, and then to rush on the crew and murder them and plunder the vessel. Too often have they succeeded, and as often have they paid dearly for their cruelty and deceit. In the case of the ship Boyd (Captain Thompson), in 1809, at Wangarrae, when they so thoroughly attained their object in murdering the crew and plundering the vessel, which was richly laden, many of the plunderers paid the penalty of their lives for the act, the vessel having a considerable quantity of powder on board, and from their utter ignorance of its power, by some means caused it to ignite, which blew up the vessel, killing or maiming for life all on board; nor did their suffering end here, for they brought down upon themselves the vengeance of every vessel that visited the coast for years after.

I was assured by some of the natives whose fathers assisted in murdering the crew of the French vessel commanded by Marion, that the attack was unpremeditated; it was from Marion's ignorance of the customs, and particularly of the religious prejudices of the New Zealanders, that he lost his life and crew, as no act is more likely to cause the displeasure of the natives than the use of the seine*, for most of the best beaches are tabooed or sacred. The natives entreated

* Those who are not acquainted with the loss of the French vessel commanded by Marion, may

the crew not to draw the seine on shore, but either from obstinacy or ignorance they persisted; the result of this act was, that the natives plundered the vessel, and murdered the whole of the crew; and then cooked the crew and devoured them. When I was at the Bay of Islands in 1836, a French surveying vessel came into the bay, which caused some commotion among the natives, who thought that they had come to revenge the massacre of MARION and his crew, which happened twenty-seven years previous; thinking that other nations were as revengeful as themselves, and sure of resenting an injury after the expiration of so many years.

The last massacre was that of the Boyd's crew, and all must acknowledge that the unfortunate captain was to blame. This event took place about twenty-five years back, since which time they know us better and respect us more; in proof of which it may be mentioned, that ten years since the brig Mercury was taken possession of by the natives, after which the crew endured a series of offences and ill-treatment which, compared with the fate of the Boyd, shows that the temper and ferocity of the natives are much harmonized and improved. I believe not one of the crew of the Mercury was murdered; but, being terrified, they abandoned the vessel, and she became a wreck. If we carefully examine the catalogue of dreadful massacres they have been charged with, it will be found that the Europeans have always been the aggressors; and can we be surprised that after they have received a series of offences a savage should seek revenge?

I am quite satisfied that the conduct of these islanders is very superior to that of any other natives in the South Seas. When you speak to them on the subject of the murders that they have committed on the British, they will tell you that "they did not invite you to their island for plunder and murder, but that you came and ill-used them; that you broke into their taboos or sacred grounds; and that the Atua or God gave you into the hands of their fathers."—But from what I know of the New Zealanders, I am convinced that they desire to cultivate our acquaintance, since they wish to possess our manufactures, as muskets, powder, blankets, &c., and that an Englishman, if he is at all acquainted with their peculiarities, may live in peace and safety.

As I have stated that polygamy is carried on to a great extent, a description of their method of courtship may be amusing to your readers. A man seeing a woman whom he would like for his wife, asks the consent of her father, which, if he obtains, he carries her off by force, she resisting with all her strength; and as the New Zealand girls are very strong, sometimes a dreadful struggle ensues. Both are soon stripped to the skin, and it is not unfrequently the work of hours

be informed that its destruction was attributed to the use of the seine for fishing on some of the sacred ground after being requested not by the natives.

to remove the fair prize a hundred yards. If she breaks away she instantly hastens from her antagonist, and he has his labours to commence again. Sometimes she secures her retreat in her father's house, and her lover loses all chance of obtaining her; but if he carry her into his own house she immediately becomes his wife.

The women have a decided dislike to marriage, which scarcely can be wondered at, when we consider how they are circumstanced; whilst single they can enjoy all the privileges of the other sex; they can rove where they please; they are entirely beyond restraint and control, and are at liberty to bestow their favours on whom they please; but when married their freedom is all at an end; they are then no better than slaves, but must submit themselves to labour and drudgery to their husbands, who have the power of life and death over them. In a group of New Zealanders you may easily recognize the slaves, who look both dejected and miserable, and are often maimed from the ill-treatment of their masters; and it not unfrequently happens that at the death of a chief most of his slaves are sacrificed. A male slave is not allowed to have connection with a female on pain of death.

I made several excursions into the interior of the country, all of which tended to confirm my good opinion of the natives. The next paper will contain a description of their mode of warfare, and their funeral ceremonies. Some of your readers may consider that I am filling your pages with useless trash; but I am so interested in the people and country that I have more to say if you find me room in your valuable pages. When you think any of my papers are without interest, I trust you will not fail to intimate the same, and I will desist.

Martin Hall, near Bawtry,
January 28, 1838.

[To the sequel of Mr. Short's series we—in common, doubtless, with our readers—look forward with pleasure for a rich store of interesting and valuable information relative to New Zealand.—Ed.]

DERIVATIONS OF THE LATIN NAMES OF BRITISH PLANTS.

By T. B. Hall.

(Continued from page 63.)

Agrostis.—From αγρος, a field, because common therein; certain species being worthy of cultivation.

Agrostis spica-venti, Silky Bent-grass.—It is liable to be smutted. Horses and Goats eat it, Sheep refuse it. After the spring-sown corn has vegetated,

until the harvest, flocks of Pigeons may be observed, with the most patient perseverance picking a precarious sustenance from the immature seeds and panicles of the grasses, justly remarked in the old couplet—

"The Pigeon never knoweth woe
Until a benting she doth go."

Sheep never touch the stalks of grasses in general; and it may be here observed, with WHITE, of Selborne, that Rabbits make incomparably the finest turf, for they not only bite closer than larger quadrupeds, but they allow no Bents to rise: hence warrens produce much the most delicate turf for gardens.

Agrostis vulgaris, Fine Bent-grass.—The earliness of this grass appears, according to Mr. SINCLAIR'S observations, to be its chief agricultural value, the produce being far from abundant. SWAYNE observes that it is disliked by cattle, as are the Bents in general. In the sterile Hebrides, however, it is deemed valuable. The straw yields an excellent plat for the manufacture of hats and bonnets.

Agrostis setacea, Bristle-leaved Bent-grass.—On a sunny day the panicle is beautifully spreading, but it collapses very quickly in cloudy weather, or on being gathered.

Agrostis alba, Marsh Bent-grass.—The variety *stolonifera* is the famous Fiorin-grass of Dr. RICHARDSON and the Irish agriculturists, so much lauded on account of its abundant produce.

Aira.—From αιρω, to destroy, or take away. So named because it ought to be removed. HOOKER observes that this name was anciently applied to *Lolium temulentum* (Bearded Darnel), on account of its injurious effects: and now removed to the present genus of grasses, though having little in common with it.

Aira cæspitosa, Turfy Hair-grass.—It is very apt to grow in tufts, and occasions irregularities in the surface of meadows. The leaves of this grass are the roughest and coarsest of all the grasses growing in pastures or meadow grounds, and therefore cattle will seldom touch them, unless forced by hunger. It produces an abundant quantity of leaves, and few flowering straws; has a very disagreeable appearance in meadows, and often occupies much ground which might be made to produce better grasses. To get rid of it, the land should first be drained, and then the tufts of the noxious weed should be pared up and burnt. The ashes will be a good manure. Called by the common people, "Hassocks," "Rough-caps," "Bull-faces."

Aira caryophyllea, Silver Hair-grass.—The whole plant is soon dried up, and can yield nothing but a little early food for Sheep.

Aira præcox, Early Hair-grass.——This trifling grass is of no agricultural use. It withers away as summer comes on.

Aira canescens, Grey Hair-grass.—WITHERING observes that the structure of the awn is remarkable; the lower half is thicker, opake and yellow brown, the

upper half very fine, whitish, semi-transparent, fixed to the centre of the broad top of the opake woody part, which is encompassed with very minute teeth (pl. 24, c.). The anthers are purple, giving a cast of colouring to the panicle.

Ajuga.—Said to be an alteration of *abigo*, to expel or drive away. The Latins attributed emmenagogue qualities to a plant called *Ajuga*, which is believed to be our *Teucrium chamædrys.*

Ajuga reptans, Common Bugle, Sickle-wort, Herb Carpenter.—This plant has been considered by the old writers as an excellent vulnerary, both internally and externally; hence the French had this expression:—" Those who have Bugle and Sanicle need no surgeon." The Rev. R. Walker observes, in his *Flora of Oxfordshire*, that almost any other leaf would probably answer the same purpose of excluding the air, and healing a wound, by what surgeons call the first intention. It is numbered amongst cooling and gently astringent vegetables, but its virtues are as yet but slightly ascertained. In sore throats, without much constitutional derangement, it is said to be a specific; and some foreign physicians of eminence have recommended a decoction of it in the quinsy. A white variety abounds in the Isle of Wight, and a flesh-coloured one has sometimes been observed. In dry mountainous situations the plant acquires a considerable degree of hairiness. The English name Bugle appears to be a corruption of *bugula*, a contractive diminutive of *buglossum*, which the plant resembles in medical qualities.

Ajuga Chamæpitys, Yellow Bugle, Ground Pine.—This plant has a degree of bitterness and acrimony, but its real use is far from being accurately ascertained. It stands recommended in the gout, jaundice, and intermitting fevers.

Alchemilla.—Named from the Arabic àlkêmelyeh, Alchemy, from its pretended alchemical virtues.

Alchemilla vulgaris, Common Lady's-mantle.—Loudon observes that it is readily eaten by Horses, Sheep, and Goats, and is considered a good herbage-plant where it abounds in upland pastures. The foregoing statement, however, does not accord very well with the following from Withering. The Rev. S. Dickenson gives the ensuing curious account of its pernicious effects on Cows:—" Being lately on a visit at Somerford, the Hon. E. Moncton requested me to examine the herbage of a meadow near the river Penk, in which he had the misfortune, a few years ago, to have five milking Cows die suddenly at once, and several more were with difficulty recovered. The symptoms of the disease, which he attributed to some noxious plant, were irremediable obstruction in the bowels. Upon examination, I found a very unusual abundance of *Alchemilla vulgaris* in every part of the field; and am inclined to believe this plant the cause of the fatality, as it is known to be of a very astringent quality. It was the aftermath the herd depastured; and the survivors, upon being introduced

into the same field the summer following, were immediately affected with similar symptoms, but removed in time to prevent the fatal consequences; since which Mr. MONCTON has never hazarded the depasturing of it by neat cattle." The English name ought to be in the singular; being so named especially of the Virgin MARY, "Our Lady," whose paraphernalia was rendered complete by the misapplied ingenuity of cloistered devotees, as diffused through the ancient herbals.

Alchemilla Alpina, Alpine Lady's-mantle, Cinquefoil Lady's-mantle.—Nothing can be more beautiful than the silvery splendour of the under sides of the leaves, especially in exposed and barren situations, when agitated by the wind. No figure can do them justice. The upper surface is smooth and naked, of a fine green. It is common on many of the Highland mountains, and supposed by LIGHTFOOT and others to aid considerably in giving the peculiarly excellent flavour to Highland mutton.

Alchemilla arvensis, Field Lady's-mantle, Parsley-piert.—It was formerly eaten raw or pickled; and thought serviceable in cases of gravel and stone. CAMDEN, in his *Britannia*, supposing it a much rarer plant than it really is, either in England or other countries, describes it as "Percepier" (q. d. break-stone), growing wild about Keynsham, in Somersetshire. The barbarous word Parsley-piert, GERARDE observes, "must have been given by some simple man, who had not well learned the true term."

Alisma.—Derived from *alis*, water, in Celtic, because the species grow in watery places.

Alisma plantago, Water Plantain, Greater Thrum-wort.—WITHERING has the following remarks respecting this plant. It is acrimonious and blistering, and said to resemble Crowfoot in its general qualities. Cattle are sometimes much injured, if not killed, by it, as atrophy and paralysis supervene. GRAY states that the juice is used for drying up milk in the breast. The tubers are farinaceous, and recommended in hydrophobia; especially in Russia, where its use was (in 1820) sanctioned by the College of Physicians of Moscow. The practice was subsequently made known in North America; and though specifics are not latterly in repute with the more enlightened of the medical faculty, it seems desirable to afford publicity to whatever may by possibility relieve so dreadful a disorder. We, therefore, insert the following notice by Mr. C. WHITLAW, of Great-Russel-Street, London, who reports that—"a remedy for the poison of the Rattle-snake was purchased by the Assembly of South Carolina, of a negro, by giving him his freedom, and an annuity of £100 for life." This remedy was derived from *Alisma plantago*, and the same writer adds—"in order to induce the faculty to give its virtues a fair trial, as as anti-spasmodic, I may observe that I have frequently seen cattle who have eaten the Alisma completely paralysed, so that they could

not stand. As death ensues from the excessive stimulant action of the poison of the Rattle-snake, and of the saliva of a rabid animal, upon the muscular system, I consider that a cure is effected by the peculiar sedative power of the Alisma, or anti-spasmodic, relaxing the spasms; and I believe it will be found to be an effectual specific for the cure of these two dreadful maladies, and also of tetanus. The best mode of administering it, when the difficulty of swallowing comes on, is to scrape about an ounce of the solid root, and let it be eaten between two slices of bread. The dose to be repeated in an hour, if the spasms are not relieved. It is called Water Plantain on account of the resemblance between its leaves and those of the Common Plantain (*Plantago major*).

Allium.—From *oleo* to smell, on account of its disagreeable odour; or from αλεω, to avoid, as being unpleasant to most people; or, according to HOOKER, from the Celtic *all*, which signifies acrid, burning. It is a genus of strongly scented bulbous plants, all of them edible, and some of them of the greatest antiquity as pot-herbs.

Allium ampeloprasum, Great Round-headed Garlic.—The bulbs are white and globose, increasing rapidly in a garden, by lateral offsets, till they compose a mass as big as a man's head, resembling a bunch of grapes; whence the old Greek name of the plant, *Ampeloprasum*, vine-garlic, might have originated; but a name of similar construction has been applied to several species from their being prevalent in the Vineyards of some countries. In this luxuriant condition it seldom produces flowers. WITHERING observes that the trivial name may have been derived from αμπελος, a Vine, and πρασος, leeky; alluding to the root, and its appendages. It is eaten along with other pot-herbs. It communicates its flavour to the milk and butter of Cows that feed upon it.

Allium arenarium, Sand Garlic.—As a curious instance of viviparous production and retentive vitality, it is recorded, on authority of a writer in the *Mag. Nat. Hist.*, that the seeds in specimens of this plant, which had been kept for two years, were found germinating in the calyx, and some had even put forth their cotyledons. The flowers are deep red and intermixed with dark purple, ovate pointed bulbs, by which, as well as by the root, the plant is increased; but Sir J. E. SMITH remarks, that such species as bear these bulbs among their flowers seldom perfect any seed.

Allium carinatum, Mountain Garlic.—This plant has but little of the Garlic smell. Sir J. E. SMITH doubts if it is really distinct from *A. oleraceum*, though it differs in the flatter form of its leaves and somewhat in size.

Allium vineale, Crow Garlic.—The young shoots are eaten in salads, or boiled as a pot-herb.

Allium oleraceum, Wild Garlic, Streaked Field Garlic.—The whole plant has an unpleasant smell, and is a very troublesome weed, difficult of extirpation,

though not of common occurrence. WITHERING observes that the tender leaves are very commonly boiled in soups, or fried with other herbs. Cows, Sheep, and Swine eat it. The smell of Garlic is said to be so inimical to Moles, that to get rid of them it is sufficient to introduce a few heads of this plant into their subterraneous walks.

Allium ursinum, Bear's Garlic, Broad-leaved Garlic, Ramsons.—Every part of the plant, when trodden under foot or otherwise bruised, exhales the strong odour of its genus; and if Cows feed upon it, ever so sparingly, the milk is rendered nauseous, and the flavour is communicated to butter, so as to be offensive, if not unwholsome; the pretty flowers are therefore viewed with disgust by those who wish in vain to eradicate such a troublesome weed from their pastures. In Khamschatka it is used as a principal antiscorbutic, as well as for culinary purposes, and is gathered in large quantities for winter service. PLINY, who first recorded the specific name, does not account for its application. The coarseness of its qualities, like the manners of some human beings, may justify the comparison.

Allium schœnoprasum, Chive Garlic.—It is preferred for early spring salads and soups, being very hardy, and milder than the other species. The roots are considered beneficial to cold, phlegmatic constitutions.

Woodside, Liverpool,
Feb. 7, 1838.

(To be continued.)

HOURS AMONG THE ROCKS AND CLOUDS.

No. I.—PLINLIMMON.

By EDWIN LEES, F.L.S., M.E.S.

GLOOMY as a phantom emerging from the womb of night—hideous as a cloaked hag in a wintry storm—and cheerless and desolate as the blast of November, sweeping from the boisterous south-west—sits solemn Plinlimmon, cowering in the eternal seclusion of fog and cloud. Few besides the lone shepherd penetrate into his turbaries and defiles, few venture upon his treacherous quagmires, and still fewer attain the eminence of his grey loose carns. There is nothing to repay the danger—nothing to invite the inquiry, and the stranger who hurries past the base of the mountain, strains his eyes in vain amidst the descending deluge to behold the grim monarch of the bogs and floods. Sulky, obstinate, unconquered, passive, and yet revengeful, he personifies the rude race that hang upon his skirts,

and penetrate his weeping labyrinths, without the energy or industry to unlock his chasms and subject his slopes to the power of enterprize and culture. In the whole wilderness of the dismal ravines environing the five-beaconed mountain, is neither tree or shrub, nor the fragment of a hut to shelter the wanderer within two or three long miles of the summit. Mists take a long and deep slumber upon the mossy hollows, and are only roused when a blast from the north, thundering upon the broken carns, clears for a moment the wild table ridges, and the clouds lazily roll into the deep hollows below, speedily to re-ascend and prowl round their old positions. But there is no prominent mark to assure the wanderer of his bearings; the five summits of the mountain, all nearly of equal height, circle round a flat expanse and assume the same monotonous aspect, each crowned with a similarly-formed dreary carn; and still wherever the turf or moss has been laid bare by the storm, the same black bog-mud, or the same pavement of snowy quartz-rock meets the wearied eye. Even the eager sportsman, who once a year fires upon the scattered and almost annihilated Red Grouse, warily takes his shepherd-guide and bag of rations for the long-protracted expedition; and woe to the luckless wight who, confiding in his map, becomes inextricably involved in grave-like turbaries, and deep ravines, where no skill can avail to push forward through impassable quaking-bogs, or overcome the interminable deviations they occasion; where to go on is dangerous, and to retreat impossible. Amidst his efforts, perhaps, the sun goes down, engulphed amidst the darkest masses of vapour that fill up the west, and the deepening shadows usher in confusion and despair.

But there is, after all, a charm in the very risk a desolate series of quaking bogs and labyrinthal defiles offers to the foot of the naturalist. To be involved in the embrace of the fleecy cloud, levelled prostrate by the rude north wind at the base of a carn, chase a scudding hat or sketch-book down a steep declivity into the splashing stream, or, seated on the soft moss, discussing sandwiches and brandy, are enjoyments which exercise and imagination will always seek, even at the risk of that almost wished-for consummation of *losing one's way*, or leaving a solitary carcase well fixed in a bog, to be exhumed some centuries hence for the benefit of science! But then it is requisite to have company in order to be *pleasingly* lost. To sink midleg in water—to scale a fearful crag for an observation which the gloom allows not—to trace in twilight the threadings of a stream, now deep and silent beneath black towering rocks, and now suddenly gliding down a slippery barrier, and raving and roaring amidst huge bouldery obstructions, all uncertain whither the defile tends, and which of its now diverging forks leads soonest from the wild hills—or to plunge at random into bog and gulley over mound and roaring waters for some phantom light or supposed cottage window that disappears at length while in mid-chase—all this and more than

this, nay a midnight bivouac amidst the Heath and Parsley-fern, with exhausted supplies and a wet pillow to boot, may be enjoyed and laughed at with a companion to laugh *with*, to say nothing of its future importance as an adventure, with additio n and corrections at the social feast, or to be reserved up in an afternoon dose before a December fire! But alone upon the grey hills, when "the spirit of the mountain shrieks," and the red crescent of the young moon swims for a moment and is then drowned in the rushing deluge of on-sweeping clouds that at once obliterate rock, fell, and flood, is scarcely enviable. For if in stern reality night closes in, and from every gully in the mountain a succession of gusts howl as they burst maddening from their iron dungeons, and the water-spouts of heaven crashing upon the rocks, urge every torrent into winged messengers of desolation—the silent and despairing wanderer looks around for succour and assistance in vain, all glee is repressed, and even the hoarse "*dim saesnach*,"* would now be music to his ear. But he must move on in his dubious and difficult course, in Ossianic language "slow as a gathered cloud when the winds drive it from behind."

Is this all fancy? Try it then, young enthusiasts of Nature, in an autumnal day in the wolds of Scotland, or on the mountains of Wales, but take no companion, not even a Dog; choose a misty day, when "the sun retires red and slow behind his cloud," and think of him who perished on the Red Tarn Crag in Cumberland, whose obsequies were sung by the Grey Plover flying, and whose memory has been embalmed by the muse of Scott—

"Dark green was that spot, midst the brown mountain heather,
Where the pilgrim of Nature lay stretch'd in decay,
Like the corpse of an outcast abandon'd to weather,
Till the mountain winds wasted the tenantless clay."

Plinlimmon, too, has had its victims, and the spirit of "*Catrin Gwyn*," or *White Kitty*, is still talked of by the shepherds, as haunting a rocky glen by the Bygeilyn Pool, where an unfortunate woman, overtaken in a tempest at night, mistook her path, and was lost in a quagmire.

This autumn I first awoke to the *idea*, and yet only to the *idea*, of the utter desolateness of heart and keen despair he must feel, who amidst the pitiless war of elemental strife, wakens to the fearful thought that he is in danger, and may probably perish. The courage of the battle-field is unavailing here, for the object is to retreat, danger on every side, but uncertainty and apprehension adding dismay and confusion. I was on the Glyder-Vawr, the steepest and most dangerous of the Snowdonian satellites, but I must needs cross its broken pillars to skirt Llyn Idwal in my way from Llanberris to Capel Curig. Snowden, gloomy

* No English! the usual gruff reply of the peasantry in Wales, to a stranger's inquiry.

as a demon, had for a week past shown nothing higher than his red shoulder, Crib Coch. The sun was invisible, and evening hurrying on, as by bog and lichened rock rising at intervals like stones of memorial, we scaled the precipitous Glyder. But I had a guide, for the track was unknown to me, and mist on the summit of every mountain and hill. We paused, wearied, and leant on some mossy masses of stone. Still it was partially clear, but in a moment a grey volume of clouds, volley after volley, shot past us by an opening in the rocks, filled up the whole scene, and, slowly curling round, coldly encircled us in their damp embrace, and deeper and deeper curtained us round. But it was without a sound; not a whisper of wind or water was heard, not a cry from a Plover or a Raven mixed with the heavy atmosphere. The fog rolled and heaved in denser volumes, and seemed to bring the utter solitude and silence of death. We seemed alone in a world of vapours, before untrodden and unknown, and beyond their solemn shade a new creation seemed concealed from view. On we wandered, silent as the scene around us, ever and anon a pinnacle of grey stone like a half-demolished cromleck or desecrated circle suddenly darkening to view in the fog; and I thought we were ascending a rocky staircase that had no termination but in the heaven above us. Still my guide progressed before me, his gaunt figure often disappearing entirely from view and sometimes mistaking an oblique rock for him, ere I again recovered him. At length he paused—in a fog who can make every movement true? and as the best may fail, so my guide had lost his clue, was out in his bearings, and was unable to proceed with certainty. I had enjoyed the cold sullen solemnity—the world of ghosts and vapours we were communing with; but knowing we were seven or eight miles from quarters, with night impending and short rations, I sounded a parley, and called a council. But vainly on Crib Discyl, Moel Siabod, and Carn Davydd did I call to withdraw their forces; fresh squadrons still pushed on from Wyddva, the Snowdonian prætorium, and nothing remained but a retreat in the face of the enemy, if possible before night fall. We found we were on the verge of a steep precipice, and my companion approaching to its very verge, rolled down mass after mass into the deep profundity, and stood listening to its fall—but there was no reply. He then said he must venture the descent alone, and if he found the passages practicable he would give me notice by shouting; if not he would return when he had examined the vicinity as well as he could. So saying he left me, and his dark figure disappeared instantaneously below the face of the rock. I wrapped my cloak about me, sat on my collecting-book, and long anxiously listened. But there was no sound, and I now began to consider the probability that from the depth below no sound *would* reach me, that he might wander on unconsciously, be unable to ascend again, or be altogether uncertain of the exact spot where he left me. Thought crowded upon thought, and anxiety urged me to make an

effort on my own behalf, but, unpleasant as it was thus to linger, I felt that it was more dangerous to stir, where one incautious step might plunge me into endless night. I sat, therefore, surely in suspense of no enviable kind, till, after long lapse, a sound, hoarse as a huge branch sundered by the gale, came upon my ear as if toiling up the precipice.—It was repeated like a stone bounding again and again upon the hollow ground, but came up to me faint as a distant echo!

It was more like a summons to execution than a note of encouragement, but I shouted answer, and prepared to obey its summons. It was no easy task. Loaded with my cloak and folio of plants I approached the precipice. It was all slippery with moisture, and there was no certain footing upon the friable rock, while the depth of the gulph into which I was lowering myself it was impossible to fathom. A prill wept down the face of the dark cliff, and at some distance below had scooped itself a deep gullet down which the water, as it gathered and gained an impetus, foamed and gurgled, and fretted and bounded. Letting my folio speed its way as it best could, I called in the full power of legs and arms to aid my descent, and with some difficulty screwed my way down into the bed of the rivulet, which I groped along for some distance, till the increasing declivity and foaming of the water warned me of a precipitous plunge, and I defiled again laterally to the face of the rock. Here I gave notice of my progress by a loud hallo, and while I paused for a reply, looked about my lithological perch. All was still gloomy and dubious beneath me, and I clung tightly within a hollow cranny, lest the space beneath me should offer no resting place but the thin air to interpose between myself and the horrid rocks hurled in many an avalanche to the base of the precipice. Yet the charm of vegetable beauty was even there—*Saxifraga stellaris* studded the wet stones with its verdant stars and red capsules on long stalks; the Alpine Rue (*Thalictrum Alpinum*) spread its delicate little leaves upon the rock, *Lycopodium selaginoides* lifted up its agglomerated club-like fructification, and the elegant *Bartramia fontana* dripping with moisture, claimed attention to the microscopic elegance of the peristomes of its numerous fairy urns.

But again in nearer tones sounded my guide's voice, directing my downward progress by rock and gully, till, after many a slip, I found myself emerging from the fog, and within view of Clyn Carns at the very base of the rocks, below a roseate hue faintly tinging the east, and the awful brow of Carnedd David solemnly rising in the twilight. We had still a long pull to Llyn Idwall, and as we emerged to the lake side from among the enormous detached boulders below the black rocks of Twll Ddu, or the Devil's Kitchen, and crossed the rushing torrent, night had steeped in sable the solemn vista before us, and we could barely trace the caitiff Heron flagging silently away high in air.

I looked up the ravine, upon the enormous sable rocks split and shattered by many a wintry tempest, down which the torrent muttered its malediction and

buried itself deep in gloom, with mingled feelings. All was dark and horrific above, and from the tempest of ruin scattered round, it was evidently unsafe to penetrate too far into the demon's den, many of whose weighty masses of cliff seemed to hang tremblingly in the air, among the vapours that veiled their serrated pinnacles, and I was not sorry to be safe at their base, instead of treading the dizzy verge of their summits to seek an outlet. Below me Llyn Idwat lay pillowed still as death in his mountain tomb, a pall of excessive darkness, impenetrable to the eye, spread over its uncertain boundaries from the over-hanging precipices, above which the kingly crest of Carnedd David, rising with stately grandeur in the ebon sky, seemed to exercise a solemn guardianship. As we descended the slippery rocks I seized specimens of the Cambrian Poppy (*Meconopsis Cambrica*), starting forth from the gaping crevices, tbe beautiful *Saxifraga oppositifolia*, *S. hypnoides*, and its affinities, here profusely carpetting the masses of rock by the splashing torrent, and the red-tinged foliage of that constant rock-lover *Rhodiola rosea*. We now skirted the black Llyn to where, amidst stones of all shapes and sizes—

> "As if the moon had shower'd them down in spite;"

its waters reluctantly growled with hoarse voice a sad adieu to their mountain cradle. A bridge, rough and rugged as the scene about it, now offered its last churlish aid, and my guide, who had told of travellers perishing without hope on Moel Siabod and other mountains about Capel Curig in storm, cold, and snow, having now emptied his budget, and scenting the termination of his duties, though yet afar off, sped on far in front to light his pipe at the next dwelling near Llyn Ogwen, and left me to my meditations.

Yet even in summer, bright, fervid, and glorious, without a cloud to check the insufferable brightness, one may incautiously get entangled in the woody vallies, as in antumn upon the mountains. One afternoon, straying on the margin of an extensive wood, bordered with showering Roses, bright *Orchideæ* and numerous other plants, now watching the progress of a marbled Butterfly (*Hipparchia galathea*), among the pink Trefoils, now following the devious flight of a "chalk-hill blue" (*Polyommatus Corydon*), among the scattered bushes, I imperceptibly got involved in "the navel of this hideous wood." To find path where path was none, was a tedious process, till, all inlet and even outlet failing, I was fairly made a captive in the thorny maze. Wherever the least opening appeared it was sure to terminate in a dense thicket of thorns and brambles, while the foliage, just deep enough to smother one over head and ears, but offering no large timber for an observing climb, was peculiarly tantalizing. I turned, stopt, pushed on, crept,—dashed franticly among the underwood till I was covered with thorns—all was vain; the sun rapidly descending to his evening couch, now shot vividly

his level rays upon the foliage, but could not penetrate their interior. As a last resource, I drew a large clasp-knife from my pocket, and in the direction of the west cut down all before me, till I was tired of slaughter, but without apparently bettering my condition. I began to prepare for a night vigil in the wood, and—

"Under the greenwood tree
Who loves to lie with me,"

presented itself as a very apt quotation adapted to my present circumstances, only that unfortunately no one *could* respond to my call. At last, towering afar-off like a turreted cloud rising in the western horizon, a mighty Oak met my view, and my knife was again put in requisition to hack my way towards his dominance, meaning from his high head to take a keen survey of my forest position. He seemed surrounded with a triple guard—on one side the dwarf Blackthorns, with ten thousand multiplied spines, presented a barrier utterly impenetrable to my scanty means of offence, even had the day and not the night been before me—on another side Brambles ramified thicker than snow-flakes wound around each other, arching and inarching with curved spines, enough to terrify an Indian—here and there flanked by a dwarf spreading Hawthorn or Holly-bush,—while a crowd of tiralleurs in the shape of Thistles, rampant Nettles, and Furze, swarmed in the advance. Round this rampart I slowly wheeled, now and then attempting a charge upon the enemy, but to very little purpose, finding them too anxious to retain me among them! While thus engaged in a recognizance, Fortune, ever faithful to the brave, led me stumbling against a mound which stopped my progress—and no poor captive flying from a dungeon ever felt more pleasure than I did, when, on scaling this mound, I perceived only a rude ditch between me and a scattered vista of trees leading to the termination of the wood.

But I began about *Plinlimmon,* its rocks, and its waters; I got among its clouds, and whither have they led me? They have whirled me like the umbrella I have heard of, that left its master's hand on the top of Cader Idris, and was found the next week on Plimlimmon, only that in this case *I* have been swept *from* the mountain. Well, I have only in this case to borrow another umbrella to get to it again, and I shall do so forthwith, for I have not done with the "Rocks and the Clouds" yet.—Plinlimmon has only been *looked at,* certainly not ascended: there I just catch his gloomy outline in the west as he slowly blankets himself up for the night. He is a good twelve miles off, for I am only now pausing at Llanidloes, below that bold Cat's-back ridge that struts up the Clydach glen whose wier increases its sullen thunder with the increasing gloom. Gloomy as the landscape now becomes, one flask of light, as if forgotten, settled on the heathy ridge now in glorious blossom, but has it in a purple glow of radiance,

now changing into lilac, that even night seems unable to dispel. But I have raised my eyes for a moment to mark that low ranging Buzzard who seems to have just captured a young Rabbit—and all the glorious tints are gone. So over the young Severn and through the silent timber-hutted streets of Llanidloes, and beneath its low-tumbling town-hall, to my quarters at the Throttle-puppy Arms.* In Wales, certainly, "Arms" are ever open to *take in* the stranger, and the cry of "Arms" is for ever in his ear! From the child to the dotard, all are presumed to be in "Arms," and certainly *extortion* places "arms" in all hands, from the urchin who runs after every carriage crying "penny," to the matured *ewmry* who thinks the Sasenach *gold* hardly pays his important services in leading the stranger to a rock or waterfall, that but for the stranger he himself would have never regarded. The fact is, after all, whether one travels with "arms" or without them, in the desert or turnpike-road, tribute must be paid—and it is all the same whether one hands out to the Arab or the inn-keeper. Here, boots, send the chamber-maid, and call me up at five precisely, for to-morrow sees me in the clouds with Plinlimmon!

LIST OF FLOWERING PLANTS FOR EVERY MONTH IN THE YEAR.

April.

(Continued from page 140.)

Tuberous Moschatell, *Adoxa moschatellina;* Yellow Bugle, or Ground-pine, *Ajuga chamæpitys;* Common Alder, *Alnus glutinosa;* Mountain Anemone, *Anemone Apennina;* Wood Anemone, *A. nemorosa;* Pasque-flower Anemone, *A. pulsatilla;* Common Wall-cress, *Arabis thaliana;* German Madwort, *Asperugo procumbens;* Maidenhair Spleenwort, *Asplenium trichomanes;* Early Winter-cress, *Barbarea præcox;* Common Daisy, *Bellis perennis;* Common Birch, *Betula Alba;* Common Turnip, *Brassica rapa;* Common Box-tree, *Buxus sempervirens;* Vernal Water-starwort, *Callitriche verna;* Bitter Ladies'-smock, *Cardamine amara;* Hairy Ladies'-smock, *C. hirsuta;* Meadow Ladies'-smock, *C. pratensis;* Round-headed Carex (or Sedge), *Carex pilulifera;* Vernal Carex, *C. præcox;* Great Common Carex, *C. riparia;* Glaucous Straight-leaved Carex, *C. stricta;* Loose Pendulous Carex, *C. strigosa;* Little Mouse-ear Chickweed,

* Among the thousand-and-one "*Arms*" spread in every direction to *catch* the poor wandering Saesnach in the Principality, I noticed "Vulcan's Arms" at Aberystwith, though I should feel dubious of trusting myself within their brawny grasp!

Cerastium semidecandrum; Broad-leaved Chickweed, *C. vulgatum*; Smooth Cow-parsley, *Chærophyllum sylvestre*; Horse-radish, *Cochlearia armoracia*; Common Hasel-nut, *Corylus avellana*; Spurge-laurel, *Daphne laureola*; Common Spurge-laurel, *D. mezereum*; Bulbiferous Coralwort, *Dentaria bulbifera*; Common Whitlow-grass, *Draba verna*; Corn Horse-tail, *Equisetum arvense*; Great Water Horse-tail, *E. fluviatile*; Branched Wood Horse-tail, *E. sylvaticum*; Alpine Cotton-grass, *Eriophorum Alpinum*; Common Cotton-grass, *E. angustifolium*; Broad-leaved Cotton-grass, *E. polystachyon*; Downy-stalked Cotton-grass, *E. pubescens*; Wood Spurge, *Euphorbia amygdaloides*; Red Shrubby Spurge, *E. characias*; Common Beech, *Fagus sylvatica*; Common Corn-salad or Lamb's-lettuce, *Fedia olitoria*; Common Ash, *Fraxinus excelsior*; Simple-leaved Ash, *F. heterophylla*; Chequered Daffodil or Snake's-head, *Fritillaria meleagris*; Solid Bulbous Fumitory, *Fumaria solida*; Spring Gentian, *Gentiana verna*; Common Dove's-foot Crane's-bill, *Geranium molle*; Common Ground-ivy, *Glechoma hederacea*; Stinking Hellebore, *Helleborus Fœtidus*; Green Hellebore, *H. viridis*; Umbelliferous Jagged Chickweed, *Holosteum umbellatum*; Rock Hutchinsia, *Hutchinsia petræa*; Early Knappia, *Knappia agrostidea*; Great Henbit, *Lamium amplexicaule*; Spotted Henbit, *L. maculatum*; Greater Tooth-wort, *Lathræa squamaria*; Common Dandelion, *Leontodon taraxacum*; Field Wood-rush, *Luzula campestris*; Broad-leaved Hairy Wood-rush, *L. pilosa*; Perennial Mercury, *Mercurialis perennis*; Water Chickweed, *Montia fontana*; Trailing Hairy Water Scorpion-grass, *Myosotis intermedia*; Yellow-and-Blue Water Scorpion-grass, *M. versicolor*; Pale Narcissus, or Primrose Peerless, *Narcissus biflorus*; Early Purple Orchis, *Orchis mascula*; Early Spider Orchis, *Ophrys aranifera*; Yellow Star-of-Bethlehem, *Ornithogalum luteum*; Common Star-of-Bethlehem, *O. umbellatum*; Common Wood-sorrel, *Oxalis acetosella*; Annual Meadow-grass, *Poa annua*; Common Knot-grass, *Polygonum aviculare*; Aspen, or Trembling Poplar, *Populus tremula*; Strawberry-leaved Cinque-foil, *Potentilla fragariastrum*; Spring Cinque-foil, *P. verna*; Oxlip Primrose, *Primula elatior*; Cowslip Primrose, *P. veris*; Common Primrose, *P. vulgaris*; Wild Plum, *Prunus domestica*; Wild Belluce, *P. institia*; Sloe, or Blackthorn, *P. spinosa*; Wild Service, *Pyrus torminalis*; Common British Oak, *Quercus robur*; Sessile-fruited Oak, *Q. sessiliflora*; Wood Crowfoot, *Ranunculus auricomus*; Pilewort Crow-foot, or Lesser Celandine, *R. ficaria*; Tasteless Mountain Currant, *Ribes Alpinum*; Common Gooseberry, *R. grossularia*; Common Butcher's-broom, *Ruscus aculeatus*; Long-leaved Willow, *Salix acuminata*; Almond-leaved Willow, *S. amygdalina*; Green Mountain Willow, *S. Andersoniana*; Water Willow, *S. aquatica*; Little Tree Willow, *S. arbuscula*; Round-eared or Trailing Willow, *S. aurita*; Shining Dark-green Willow, *S. bicolor*; Great Round-leaved Willow, *S. caprea*; Folded-leaved Willow, *S. carinata*; Grey Willow, *S. cinerea*;

Quince-leaved Willow, *S. cotinifolia*; Broad-leaved Monadelphous Willow, *S. Croweana*; Broad-leaved Mountain Willow, *S. Dicksoniana*; Fine Basket Osier Willow, *S. Forbyana*; Crack Willow, *S. fragilis*; Rose Willow, *S. helix*; Hairy Branched Willow, *S. hirta*; Boyton Willow, *S. Lambertiana*; Sharp-leaved Triandrous Willow, *S. lanceolata*; Apple-leaved Willow, *S. malifolia*; Dark Broad-leaved Willow, *S. nigricans*; Shining-leaved Willow, *S. nitens*; Dark Long-leaved Willow, *S. petiolaris*; Early Prostrate Willow, *S. prostrata*; Plum-leaved Willow, *S. prunifolia*; Rosemary-leaved Willow, *S. rosmarinifolia*; Green-leaved Osier Willow, *S. rubra*; Bedford Willow, *S. Russelliana*; Silky-leaved Willow, *S. Smithiana*; Withered-pointed Willow, *S. sphacelata*; Bilberry-leaved Willow, *S. vaccinifolia*; Veiny-leaved Willow, *S. venulosa*; Common Osier Willow, *S. viminalis*; Wulfenian Osier Willow, *S. Wulfeniana*; Purple Saxifrage, *Saxifraga oppositifolia*; Two-leaved Squill, *Scilla bifolia*; Vernal Squill, *S. verna*; Scaly Hart's-tongue, *Scolopendrium cetrach*; Common Groundsel, *Senecio vulgaris*; Blue Moor-grass, *Sesleria cærulea*; Common Stickwort, *Stellaria media*; Common Yew, *Taxus baccata*; Common Shepherd's-purse, *Thlaspi bursa-pastoris*; Perfoliate Shepherd's-purse, *Th. perfoliatum*; Channel-leaved Trichonema, *Trichonema bulbocodium*; Wild Tulip, *Tulipa sylvestris*; Colt's-foot, *Tussilago farfara*; Butter-bur, *T. petasiter*; Common Small-leaved Elm, *Ulmus campestris*; Broad-leaved or Wytch Elm, *U. montana*; Bog Whortle-berry, or Great Bilberry, *Vaccinium uliginosum*; Procumbent Field Speedwell, *Veronica agrestis*; Ivy-leaved Speedwell, *V. hederifolia*; Blunt-fingered Speedwell, *V. triphyllos*; Vernal Speedwell, *V. verna*; Spring Vetch, *Vicia lathyroides*; Dog's Violet, *Viola canina*; Hairy Violet, *V. hirta*; Sweet Violet, *V. odorata*; Marsh Violet, *V. palustris*.

CORRESPONDENCE.

Anecdote of a Snake and a Toad.

To the Editor of the Naturalist.

My dear Sir,—If the following notice is worth your attention, I shall be happy in its meeting your approval.

A few summers ago, when walking across a field of newly-cut Clover, my attention was arrested by seeing a Common Snake (I call it common in distinction from the Adder or Viper), busily employed swallowing a Toad of considerable size. The Snake was so intent upon the business that it allowed me to approach within two or three yards, and I was thus enabled to witness its efforts

in passing so large a body into its stomach. It appeared to me more like drawing the skin of the Snake over the Toad than the action of swallowing. The means by which this was accomplished seemed to be by the jaws getting a considerable quantity of loose skin arranged in folds around the body of the Toad, and then by a convulsive jerk advancing the head forwards. The poor Toad seemed perfectly aware of the danger of its situation, and offered all the obstruction in its power, by swelling its body and cheeks, and extending its fore legs at right angles to the jaws of the Snake.

My anxiety to obtain a closer view alarmed the Snake, which ceased its attempts to swallow its victim, which it disgorged by two or three smart jerks, and then made the best of its way to an adjoining copse: but I killed it before it reached the wood.

On turning to examine the unfortunate Toad—which had hobbled off to the extent of its ability—I found that it had received no further injury than a few scratches on its belly, caused evidently by the action of the Snake's lower jaw passing over the body. I carried the poor creature beside a hedge, and there left it to ruminate upon its escape from the jaws of death.

Very truly yours,

W. H. Bensted.

Maidstone, Feb. 7, 1838.

Formation of the Bark and Wood of Trees.

To the Editor of the Naturalist.

My dear Sir,—The " fact for naturalists" inserted in Vol. II., p. 492, of your Magazine, quite confirms the views of botanists on the formation of the bark and wood of trees. The tree being brought together by the chain, after being shivered by lightning, would still derive nutriment from the earth which would enable its leaves to send downwards a new formation of wood; this latter would, in the course of a few years, not only cover the chain, but also consolidate its broken parts.

I remain,

Yours sincerely,

Edwin Lankester.

Campsall, near Doncaster,
Jan. 12, 1838.

CHAPTER OF CRITICISM.

Reply to Mr. Hall's Queries respecting certain Plants.

To the Editor of the Naturalist.

Dear Sir,—In answer to the queries of T. B. Hall, Vol. III., p. 26, none of the four plants mentioned are in Loudon's *Hortus Britannicus.* I have *Malope grandiflora*, but with no other name. As for *Nigella Romana*, I have it also. I think it is *Nigella damacena*, but am not sure. It is figured in one of the early volumes of Curtis's *Botanical Magazine.* Of the other plants alluded to by your correspondent I know nothing.

Mr. Hall must not place implicit reliance on Loudon, as I find his list of *Opuntiæ* very incorrect. Should this meet his eye, I suppose I shall bring upon myself the vengeance of the colossal book-maker, but "that peril rests upon my single head."

T. K. Short.

Martin Hall, Feb. 1, 1838.

[In books of such "colossal" dimensions as those of Mr. Loudon, it is scarcely surprising that numerous errors should occur, notwithstanding all the care and labour that may have been bestowed on the productions. The fact of a book's being compiled is certainly not enough to damn it, and Mr. Loudon's works have evidently been printed on the "high-pressure" principle. Botanists and naturalists generally are, beyond all question, deeply indebted to Mr. L. for his unremitting labours for the advancement and diffusion of Natural History; but, even supposing this were not the case, the candid and impartial spirit in which he is at all times ready to attend to notices of his errors—whether supposed or actual—is alike deserving praise and imitation.—Ed.]

On Mr. Lankester's Remarks respecting Christmas-Day, 1837.

To the Editor of the Naturalist.

Bewsey House, Feb. 3, 1838.

My dear Sir,—Mr. Lankester seems to have fallen into an error, at p. 108, respecting the temperature on Christmas-day. The thermometer here was no higher than 52°, and this, considering the time of year, manifested a remarkable degree of warmth. Mr. Watson, in his *Geographical Distribution of Plants*, has given several tables, illustrative of the distribution of heat in Britain, at various periods of the year. From these it appears that at Manchester the average

temperature in December is 41.10., and in January 36.90. The mean temperature of winter at the same place Mr. Watson states to be 39.00.—of spring 47.00.—and that of summer 59.03. The result of observations made at other places varies little from the preceding. That Mr. Lankester has experienced a lower temperature than 61° in March will, therefore, not appear improbable. In fact if the thermometer was really the height stated (61°), Mr. L. must have had the pleasure of witnessing a *warm summer's day* (pardon the *Hibernianism*) in December! The mean March temperature is, however, much lower than 52°. The "large coloured Butterfly" noticed was most probably *Vanessa urticæ*. Unimpregnated females of the last brood of this common species often exist through the winter, and may frequently be observed flying about on mild days in February and March (see p. 155). *Vanessa polychloros* is a much rarer insect.

I am,
Yours very faithfully,
Peter Rylands.

To Neville Wood, Esq., &c.

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

With a view of putting our readers in possession of the progress of Natural History both at home and abroad, we intend, as opportunity offers, to publish complete reports of the various Societies dedicated entirely or in part to that science, supplying every particular likely to be of interest or importance. In furtherance of this object, we shall always be happy to receive reports of Societies, metropolitan, provincial, and foreign, with the rules, lists of officers, &c., accounts of the proceedings at the periodical meetings, and, where desirable, copies of the papers read. These will be received, as hitherto, from the respective Secretaries, or from any other individual interested in the various Societies.

ZOOLOGICAL SOCIETY.

On Thursday, Feb. 1, the ordinary meeting was held, Mr. W. Sharp Macleay in the chair.—The report of the Council announced the total receipts of the past month as £2,373 10*s*. 8*d*.; and of expenditure, to the farm for rent £30, to the gardens £1,048, and the museum £138 5*s*. 2*d*. There had also been invested in the Three-per-Cents. £197 16*s*. due to the composition account, and £200 had been

invested in Exchequer-bills as part repayment of the loan. The number of visitors to the museum was 353, from whom £2 3*s*. was received; and to the menagerie 2,861, and the sum received £68 17*s*. The present number of specimens in the gardens was 1,077, of which 287 were mammalia, 773 birds, and 17 reptiles. In pursuance of a recommendation by Dr. GAMBLE passed at the last meeting, the Council had adopted a series of resolutions relative to the issue and regulation of ivory tickets, to prevent that abuse to which their circulation has been exposed. Mr. CHESTER proposed the erection of a new gate of entrance at the south-east corner of the gardens, by which a much nearer approach with greater facility would be given to the admission of visitors, and the inconveniences resulting from the extensive intercourse at one gate, particularly on Sundays, would be obviated. This motion was seconded by Mr. VIGORS, and after some discussion carried by a large majority; the latter gentleman contending against the false spirit of economy practised by the Council, which had led to a very serious defalcation in the receipts the last two or three years. In reply to a question by Mr. VIGORS, it was stated that Capt. BOWLES, R.N., had been elected in the Council in the place of Mr. E. S. HARDISTY, recently deceased.

YORKSHIRE PHILOSOPHICAL SOCIETY.

On Tuesday last, Feb. 6, the annual meeting of the Society was held at the Yorkshire Museum, in this city. There was a numerous attendance of members, B. WAKE, M.D., one of the Vice-Presidents, in the chair.

The minutes of the last annual and monthly meeting were read by W. GRAY, jun., Esq.

The following gentlemen were admitted members of the Society:—the Rev. W. J. WILKINSON, Mr. CALEB FLETCHER, Rev. WM. HEY, Hon. J. C. DUNDAS, M.P., Mr. E. R. ANDERSON, Mr. R. WATSON, and Mr. CALEB WILLIAMS.

Donations of books and specimens of Natural History, &c., were received from G. L. FOX, Esq., M.P., Miss PHILLIPS, WM. HATFEILD, Esq., JOHN PREST, Esq., THOMAS MEYNELL, jun., Esq., and the Rev. J. D. J. PRESTON: Mr. FOX's donation consisting of many interesting birds, the Eagle Owl, &c.; Miss PHILLIPS a case of twelve humming birds; Mr. HATFEILD a Wild Swan.

Professor PHILLIPS then read the report of the Council. It stated that in the number of its members, the state of its finances, and the condition of its museum, the Society has never been more fortunately circumstanced; and that from the measures now in progress there was reason to conclude that this prosperous condition may be prolonged. It would depend upon the decision of the meeting whether other facilities of access, already enjoyed by the public, should be further augmented, and new attempts made to enlarge the power and efficiency of the institution. The donations to the museum and library have been numerous and

valuable; and the Council, encouraged by the admission of many new members, had ventured to add a considerable number of specimens by purchase on favourable terms. The collection of quadrupeds now amounts to 120; of birds, 1,200; an entirely new arrangement of British insects has been begun; the valuable herbarium of the Society is in process of arrangement; a small stove is being constructed for the cultivation of tropical orchideous plants; the Roman and Monastic walls have been repaired; and a most interesting addition made to the antiquarian collections, in the cast of a Chaldean figure, sculptured on the rocks of Beyrout, in Syria. More than eight hundred volumes have been given to the library of the Society, by the late G. Hodgson, Esq., of Bridlington. The Council proposes, ere long, to select for publication such parts of the many valuable memoirs which have been read at the monthly meetings, as by their bearing on the antiquities and Natural History of Yorkshire, appear worthy of being placed in the hands of members, and offered to the public at a very moderate price. The expenditure of the year has been great, yet in consequence of the addition of no less than 22 new members during the year, and other favourable circumstances, there is a balance in favour of the Society, on the general account of the year, of £86, and though the Manor Shore property has been a source of expense, above the income derived from it, this cannot happen again. The Council has made arrangements to purchase Mr. Allis's beautiful collection of skeletons for the sum of £350, of which no less than £230 has been already received by voluntary subscription among the members, and the supply is not yet exhausted. It was stated that some additional cases were required to contain the zoological collection, and the meeting, after inspecting the treasurer's accounts, and hearing the explanation of Professor Phillips, unanimously decided to authorize the Council of the ensuing year to construct cases for the object proposed, to the extent of £200.

On the motion of the Rev. J. Graham, the report was unanimously adopted, and ordered to be printed.

Three important propositions were considered by the meeting—first, a plan for the holding of horticultural exhibitions in the museum grounds, under the direction of the Council; secondly, a proposal to continue the regulation by which strangers are admitted to the museum grounds; thirdly, a proposal to authorize the Council to open the grounds and museum on certain days of the year freely to all persons whatsoever, without payment or requiring orders from members. All these propositions, after having been fully discussed, were, with some verbal amendments, adopted. Thus the facilities which the public already enjoy will be considerably augmented, and the success of the Society, we trust, will be promoted.

The members then scrawled for the officers and Council for the ensuing year;

Earl FITZWILLIAM was re-elected president. *New Vice-Presidents*—C. H. ELSLEY, Esq.; W. GRAY, jun., Esq.; Rev. C. WELLBELOVED; and R. J. THOMPSON, Esq. *New Members of Council*—W. HATFIELD, Esq.; THOMAS MEYNELL, jun., Esq.; Dr. GOLDIE; HENRY SMALES, Esq. *Treasurer*—R. DAVIES, Esq., in the place of the late lamented Alderman GRAY; Mr. W. GRAY retiring from the office of Secretary, Mr. HENRY ROBINSON was elected Joint-Secretary with Professor PHILLIPS.

The thanks of the meeting were given to Mr. WILLIAM GRAY, for his valuable services during eleven years, and to the officers and members of the Council.—*York Herald.*

ROYAL ASIATIC SOCIETY.

This Society met on Saturday, Feb. 3, the Right Hon. C. W. WILLIAMS WYNN, M.P., the president, in the chair.—HENRY LAVER, Esq., was elected a resident member. Among the donations laid upon the Society's table, was a MS. Persian catalogue, accompanied by a letter from Professor FORBES, the donor, explanatory of its contents. The catalogue was principally valuable from containing the names of several works unknown or believed to be lost, such as the *Chronicles of Tabari* in the original Arabic, and the *Mustafa Nama*, containing 104,000 couplets in the metre of the Shah NAMEH; and although the name of the possessor, as well as the place and date, is nowhere stated, there is reason to conclude that the books existed within forty or fifty years in the library of some Indian prince; this inference may be drawn from the circumstance of "His Sublime Highness" being named in the catalogue, and from many of the books being in the Hindustani language, and of recent date.—A paper by Lieut. POSTANS, "On a Sect of *Yogis* in Cutch, known by the name of *Kanphatis*," was then read to the meeting. The Kanphatis reside in an extensive range of buildings near Danodhar, where their creed and practice is to give food and shelter to all persons demanding it, of whatever caste or sect, and without limit as to time and quantity. Their numbers are few, and they bind themselves to a life of celibacy, but their charities are large, and they have considerable revenues to enable them to comply with the very liberal rules of their order. The chief of the *Kanphatis* is understood to derive great dignity from his office, and he is not obliged to return a salute or answer a question from any one, not even from the Rájá of Cutch. This sect has its peculiar name from the immense ear-rings which its members wear, by which their ears are nearly burst. The words *khan* and *phati* meaning "ear-burst." Lieutenant POSTANS was received by these people in the most obliging manner, and was shown every thing of interest in their establishment. A portrait of the present chief of the *Kanphatis*, and a drawing of one of the immense cauldrons in which rice is boiled for the numerous applicants upon their

bounty, accompanied the paper. On this memoir Professor WILSON remarked, that the *Kanphatis* were once a powerful body; that they were probably the founders of the cave temples of that part of India; and that the figures in those temples were all represented as wearing enormous ear-rings like those worn by the *Kanphatis*. Other sects in India had similar establishments, having much resemblance to the monastic institutions of continental Europe, with the exception of there being no personal restraint on any of the members; all parties went away and returned whenever they pleased.—The reading of "An Account of the Ruins of Gúmlí, the capital of Jetwar," by Captain JACOB, closed the meeting. These ruins, which are a short distance from Poorbunder, on the coast of Gugerat, are of considerable antiquity, and contain remains of sculpture and architecture of great beauty. One of the traditions of the natives attributes the ruin of the place to the powerful imprecations of SONA KUSARIN, a beautiful woman who was betrothed to a brave warrior named RAKHAYIT. The sovereign of the country, smitten with love for the bride, caused RAKHAYIT to be put to death. The inconsolable SONA KUSARIN, to avoid the hated solicitations of the royal assassin, after uttering a fearful curse upon him and his capital, devoted herself to the flames. This event is stated to have happened in the year 1113 A.D. The authentic cause of the fall of Gúmlí was the invasion of a Mahommedan army from Sinde, which took place two centuries later than is stated in the above tradition. The most recent date discovered among the ruins answers to the year 1229 of the Christian era.

BOTANICAL SOCIETY.

This Society, established Nov. 29, 1836, holds its meetings at 75, Newman-Street, Oxford-Street. The following is part of the first annual report, read Nov. 29, 1837, with a list of officers for the current year.

Officers for 1838:—*President*—J. E. GRAY, Esq., F.R.S. *Vice-Presidents*—Dr. MACREIGHT, F.L.S.; CHARLES JOHNSON. *Treasurer*—JOHN REYNOLDS. *Curator*—D. COOPER, A.L.S. *Secretary*—G. E. DENNES. *Council*—Dr. BOSSEY; E. CHARLESWORTH, F.G.S.; W. M. CHATTERLEY; T. W. GREENE, B.C.L.; JOSEPH FREEMAN; ÆNEAS MACINTIRE, L.L.D., F.L.S.; Dr. RANKING; JAMES RICH; W. H. WHITE. *Local Secretaries*—W. BAXTER, A.L.S.; C. CONWAY; T. BODENHAM; J. A. BREWER; EDWIN LEES, F.L.S.; R. LEYLAND; ARTHUR WALLIS; Dr. BELL SALTER.

The Botanical Society of London is instituted for the promotion and diffusion of botanical science, by the formation of an herbarium, the exchange of specimens with other Societies, or with individuals, the reading of original and other papers, the formation, also, of a library and museum, and by the establishment of a botanic garden, as soon as the funds of the Society will permit.

The number of members amounts to sixty-five, of which the new members elected for the ensuing session far exceeds the expectations of the Council, who are at the same time happy to state that they have received but ten notices of secession of members. The Council refer with pleasure to the list of donors to the library, herbarium, and museum, and hope that the several donors will not cease either their favours or their exertions.

The number of British plants received amounts to 4,819 specimens, including Ferns; 767 species, including 1,313 specimens, have been arranged in the herbarium, according to the system of De Candolle. The remaining 3,506 duplicates, including 515 species, will be distributed to those persons who have favoured the Curator with lists of desiderata for that purpose. This distribution will take place under the direction of the Council, in the months of January and December every year, when each member will receive such of his desiderata as may be contained among the duplicates in the herbarium, in proportion to his contributions; those gentlemen who have not contributed to the herbarium receiving their duplicates after the distribution to the contributors has taken place. The Council beg also to inform the members, that in order to afford every facility for examining the herbarium and library, the Rooms of the Society will be open one hour and a half previous to the ordinary meetings of the Society, when the Curator and Secretary will attend to render any assistance that may be required, and to circulate the books. In addition to the extensive and valuable collection of British plants, the Council beg to announce the receipt of a large collection of French plants, supposed to be a portion of the herbarium of Jean Jacques Rousseau, together with some plants from Mahon, Minorca, presented by the Secretary. Another collection of foreign plants from America, collected by the officers of the Hudson's Bay Company, has been presented by Mr. Joseph Freeman. Also specimens of *Lycopodium circinnatum*, from the President, sent by Dr. Forbes, of Chichester. Specimens of three new British plants have been received, viz. *Claytonia alsinoides*, from Mr. W. Baxter, of Oxford; a Moss new to Britain, *Cinclidium stygium*, from Mr. Leyland, of Halifax; and specimens, of which there are many duplicates, of *Spartina alternifolia*, from Itchin Ferry, Southampton, presented by Dr. Macreight, V.P.

The Society have also received, from Mr. R. H. Schomburgh—now travelling in British Guiana—papers, accompanied by drawings, on the two following interesting plants, which were read before the Society, viz. *Victoria regina* and *Loranthus Smythii*. Likewise donations of seeds from the Cape of Good Hope, presented by M. Schmidt.

The Society is much indebted to the following gentlemen for their interesting communications:—Dr. Bossey, Dr. Mac Intire, Messrs. Schomburgh, G. E.

Dennes, M. Hopkins, J. Reynolds, H. A. Meeson, A. Lewis, W. M. Chatterley, J. Freeman, D. Cooper, A. Irvine, A. Wallis, &c.

The meetings of the Society are held every first and third Friday of the month, from November to June; and on the first Friday of every other month, at eight o'clock, p.m. Communications are received at the rooms, 75, Newman-Street.

Ladies are eligible as members, upon the same terms as gentlemen, and possess similar privileges.

The annual subscription for resident members is one guinea; corresponding members, half-a-guinea. Admission fee, half-a-guinea.

Feb. 2.—Mr. W. H. White in the chair.—A large collection of French plants, supposed to have formed part of the herbarium of the celebrated botanist, J. J. Rousseau, and presented by Mr. James Rich, was exhibited. The first part of this splendid collection was presented last year. A paper by the Curator, Mr. D. Cooper, was read, "On some new Species of Corallines described by Ferdinand Krauss, Ph.D.," translated from the German. Baron Von Ludwig —a Wurtemberg noble much attached to Natural History—presented to the Museum of his country, some months since, a large collection of natural objects from the Cape of Good Hope, amongst which Dr. Krauss discovered three new species, viz. *Amathia biseriata*, *Acamarchis tridentata*, and *Flustra marginata*. These were described in relation to their order, classes, and families, also as regarded their relative distinctions; together with many interesting particulars. It was announced that the Curator would deliver a course of lectures on practical Botany in the early part of March, commencing one hour previous to the chair being taken at the ordinary meetings.

FRENCH SOCIETY FOR THE DIFFUSION AND ADVANCEMENT OF NATURAL HISTORY.

A new Society has just been formed in France, entitled the *Société Francaise pour la Propagation et le Progrés des Sciences Naturelles*. Those who belong to it take shares, and its objects are,—1st., to generalize and facilitate the public instruction of Natural Science; 2nd., to render the taste for these sciences an object of popular study; and 3rd., to assist even savans in their pursuits, by regulating classification and nomenclature. The principal centre of this Society will be Paris, but it will have auxiliary Societies in Marseilles, Nantes, Havre, Strasbourg, Clermont, and the Pyrenees.—*Athenæum*, *Feb.* 3, 1838, communicated by T. B. Hall.

WARRINGTON PHRENOLOGICAL SOCIETY.

Since the insertion of our brief notice (p. 108) of this Institution—established Oct. 4, 1837—we have received a printed copy of its rules, &c., which we now proceed to lay before our readers.

Address.—The claims of Phrenology to be numbered amongst the exact sciences have now been before the world upwards of forty years. During this period it has been subjected by its opponents to the bitterest invective and the most unsparing ridicule: and has passed through as searching an ordeal as their acuteness and severity could devise. So far, however, from effecting its ruin, Phrenology, by the innumerable facts which its advocates have collected and published to the world, has forced itself upon the public mind, and at present, in this kingdom, there are not less than thirty societies, numbering upwards of one thousand members—at once studying and extending the knowledge of its principles amongst all classes of the community. In France and the United States of America its success has been equally great. So rapid an extension of principles, once so decidedly unpopular, unaided by adventitious support, is without a parallel in the History of Philosophy. It may reasonably excite astonishment amongst the incredulous, and general curiosity amongst all classes to become acquainted with its doctrines. Professing as it does to render the most speculative of all sciences—that of mind—the most practical, by the establishment of universal principles from the most rigorous induction of innumerable and well-observed psychological facts:—and to submit to the evidence of the senses the mental and moral character of individuals of all classes, and under all kinds of circumstances—its value, if true, cannot easily be over-estimated. The fact of so many individuals in this and surrounding nations, eminent for their knowledge in all the various branches of art and science, becoming converts to its principles, gives probability of its truth, and fully justifies if it does not demand, the careful consideration of all who have leisure to examine, and a capacity to profit by its discoveries. Under these circumstances it is considered that no further apology is required to introduce to public notice a society which has been formed for the purpose of affording its members an opportunity of examining the subject of Phrenology in all its relations, and who, without pledging themselves to all that has been written or published by phrenologists, may avail themselves of the facilities afforded by mutual association to inform themselves of all that is practicable and demonstrable in this New Philosophy: and who, without subjecting themselves to the imputation of a weak credulity, may examine the facts upon which its principles are founded and the uses to which they are applicable.

President—John Davies, M.D. *Vice-President*—William Grierson, Surgeon. *Treasurer*—Robert Gaskell. *Corresponding Secretary*—William

ROBSON. *Secretary*—S. M. WEBSTER. *Curator*—J. P. LANE, Surgeon. *Librarian*—PETER RYLANDS, Esq.

Corresponding Members—H. C. WATSON, Esq., F.L.S., Editor of the *Phrenological Journal*, Thames Ditton; NEVILLE WOOD, Esq., Editor of *The Naturalist*, and of *The Analyst*, Campsall Hall, near Doncaster; D. NOBLE, M.R.C.S., President of the Manchester Phrenological Society; WILLIAM WEIR, M.D., Glasgow.

RULES.

1. That this Society be called the Warrington Phrenological Society; 2. That it shall consist of resident and corresponding members. All members to be elected by ballot; 3. That the subscription—to be paid by resident members only—shall be 10*s*. annually, in advance. A donation of £5 to constitute a life member; 4. That the officers shall consist of a president, vice-presidents, treasurer, corresponding secretary, secretary, curator, and librarian; who shall be elected annually the first Thursday in October; 5. That the meetings shall be held each Thursday fortnight. The chair to be taken at seven o'clock precisely.

The library has already been commenced, and several casts, busts, &c., have been obtained. A complete set of busts, &c. &c. (in all 95 pieces), has also been ordered. The number of resident members amounts to twenty-four, with an immediate prospect of addition. Papers have been read by Dr. DAVIES, PETER RYLANDS, Esq., and Messrs. GRIERSON, LANE, and ROBSON. The Society prospers far better than the founders expected, and there is every probability of its firm establishment. This is the more remarkable as Warrington is an illiterate unscientific place. There is not another scientific Society in the town, and two or three which have been attempted to be established, have failed after a brief existence. A few years ago a Literary and a Botanical Society existed, but both have long been defunct.

EXTRACTS FROM THE FOREIGN PERIODICALS.

ZOOLOGY.

1. HEREDITARY TENDENCY OF CERTAIN FACULTIES IN ANIMALS; BY THOMAS ANDREW KNIGHT, ESQ.—In support of the principle which he maintains with regard to Bees—viz. that the innate desire of accomplishing certain actions is transmitted, independently of education, from parent to offspring—the author cites many facts which he has observed during experiments commenced sixty years ago, and continued up to the present time.

He states that a young terrier,* whose parents had been trained to destroy Fitchet Weasels (Polecats), and a young spaniel, whose ancestors had for generations been bred to seek Woodcocks, were brought up together as companions, and that each, on seeing for the first time the prey towards which it was guided by its hereditary instinct, pursued it with avidity, without noticing that which attracted its companion. He further remarks, that young spaniels, wholly destitute of experience, were almost as expert at Snipe-hunting as their parents, trained with care to the sport. The Woodcocks themselves have, in the course of the last sixty years, altered considerably in their habits. Their fear of Man has become, during this period, much more powerful in transmission through several successive generations.

The author believes that, by the effect of education long persevered in, these hereditary inclinations may be destroyed, and replaced by others. Thus spaniels would never have acquired the art of hunting had not Man followed the sports of fowling. A young Dog of the variety termed *chien d'arret* (setter), whose parents had been trained to seek and fetch wounded game, performed the same office as well as the best-bred Dog, although it had received no instructions. It would seem that the influence of the father and of the mother, in the transmission of these hereditary inclinations, is the same, except in the case of hybrids, in which the author believes the influence of the male to be decidedly predominant.—*Bibliothèque Universelle de Genève*, *Aout*, 1837.—[It is a well-ascertained fact, that strongly-marked peculiarities—whether mental or corporeal—are transmitted from parent to offspring, both in Man and in the lower animals. Thus in the cases alluded to by Mr. Knight, it will not appear surprising that the faculties which had been so continually exercised in terriers and spaniels should be more than ordinarily developed in the descendents of those individual animals.—Ed. *Nat.*]

BOTANY.

2. Comparative Estimate of the meteorological Circumstances under which Corn, Maize, and Potatos grow at the Equator and under the Temperate Zone.—In comparing the results which he has collected, M. Boussingault arrives at this conclusion :—The number of days which separate the commencement of the growth of an annual plant from its ripening, is, in every climate, in

* We may here seize the opportunity of replying to the question proposed to us, why we commence the English names of only *some* animals with capital letters ? Our rule is as follows :—1. The names of all *species* and *genera* commence with capitals; 2. those of *varieties*, as terrier, spaniel, &c., are not so distinguished, being of inferior value; 3. The same applies to the indication of *sex*, as bull, ewe, drake, gander, &c.; 4. Also to the indication of *age*, as calf, lamb, foal, &c. &c.—Ed.

inverse ratio of the mean temperature under the influence of which the vegetation takes place, so that the produce of this number of days by the temperature is constant. This result, says M. Boussingault, is not only important as indicating that the same annual receives throughout, in the course of its existence, an equal portion of heat; it further points out the possibility of naturalizing a plant in any country, provided the mean temperature of the month is known.

All the results of M. Boussingault's researches are condensed in a table published in our foreign cotemporary the *Bibliothèque de Genève*, to the fourteenth No. of which (for Feb., 1837) we beg to refer our readers.

3. Saccharine Nature of Beet-root.—The second supplement to the *General Catalogue of the Royal Botanico-Agricultural Society*, published by Messrs. Burden, Sen., & Co. (Turin, 8vo., 1837), written in Italian, contains instructions for the cultivation of Beet-root, and of plants used as food in general. The author considers the Beet-root first as a nutritive root and then as a sacchariferous plant. We observe, in a note, that M. Falcoz, of Chambery, obtained 60,000 kilogr. of roots per hectare, that M. Bonafous estimates the average produce at 20,000 kil., and that it may be regarded as between these two numbers.

4. Expansion and Sleep of Leaves.—The movements, observes M. Dutrochet, by which leaves take the alternate positions of waking and sleeping, have their seat exclusively in the peculiar curves situated at the base of their petioles, and which constitute to them alone the short petiole of their leaflets. These curves are sufficiently large in the Kidney-bean (*Phaseolus vulgaris*) to render the study of their internal structure easy. The leaves of this plant display the phenomena of expansion and of sleep in a very remarkable manner; their leaflets lower their points at night, and their limbs regain the horizontal posture during the day.

The curvature which constitutes the entire petiole of a leaflet of the Kidney-bean, displays, under the epidermis, a thick layer of cells arranged in longitudinal series, and which generally decrease in size from within outwards, so that when the turgescence of the tissue which they form by their junction takes place, this cellular tissue would curve by directing the concavity of the curvature outwards. This is also proved by experience; for by plunging into water a thin blade raised longitudinally upon this cellular tissue, it curves powerfully in the direction above indicated. If the blade, thus curved, be removed into syrup, it curves in the opposite direction. Thus this cellular tissue is incurvable (*i.e.*, is capable of curving inwards) by endosmose; it represents, by its disposition, a hollow cylinder of which all the longitudinal portions, if separated from each-other, would tend towards a natural position, by curving outwards. The cells of the two or three innermost layers of this cellular tissue only contain air; under these pneumatic cells is found a layer of fibrous tissue, composed of transparent fibres, of great

tenuity, and intermixed with globules disposed in longitudinal series. A blade raised longitudinally upon this fibrous tissue being plunged into aerated water, directed its curvature towards the centre of the petiole; if this blade be placed in non-aerated water, it will not curve at all. Thus this fibrous tissue is incurvable by oxygenation; under this is found a woody substance with medullary rays, and principally composed of sap-vessels and of a considerable quantity of large pneumatic tubes. In the centre of the petiole there is a bundle of fibrous tissue similar to that described above, and taking the place of the pith in this petiole which represents a little stalk. When this is exposed, we find that the petiolary bending of the leaflet of the Kidney-bean contains the two incurvable tissues which I have already described in flowers capable of closing after expansion, namely, the cellular tissue incurvable by endosmose, and the fibrous tissue incurvable by oxygenation. The two cylindrical layers inclosed one in the other which form these two tissues, would be represented sufficiently accurately by the reunion and attachment in a cylindrical bundle of a certain number of nerves of the flower of *Mirabilis*. I have pointed out, that near these nerves the cellular tissue curves outwards by endosmose, and that the fibrous tissue curves inwardly by oxygenation; which produces in the first case their state of expansion, and in the second that of sleep. The same would happen in the petiolary curvature of the leaflet of the Kidney-bean, if we suppose that the two cylindrical layers, the one exterior to the cellular tissue, the other interior to the fibrous tissue, are divided at the same time into fine longitudinal bundles. Each of these bundles is analogous to a nerve of the flower of *Mirabilis*; there will be in it, and arranged in this nerve, the two incurvable tissues capable of effecting the expansion and the closing. Supposing these bundles reunited by a membranous tissue, that would form a corolla susceptible, by turns, of expansion and closing, or of waking and sleeping. But this state of separation of longitudinal fasciæ does not exist in the petiolary curvature; these fictitious fasciæ are intimately united, and form a hollow cylinder composed of two layers; the cylindrical layer of fibrous tissue is inclosed in the cylindrical layer of cellular tissue. Let us suppose each of these cylindrical layers divided into longitudinal threads, joined to each other. The longitudinal threads of cellular tissue would dispose all to direct their curvature outwards. Now it is evident, that if their power of incurvation is equal, the cylindrical layer which they form by their junction will remain straight and equal; but if the longitudinal threads of one side of the cylinder force it by the power of incurvation to the threads of the opposite side, these would be impelled in the direction of incurvation effected by the threads which antagonise them. The same reasoning may be employed in relation to the cylindrical layer of fibrous tissue subjacent to the cylindrical layer of cellular tissue; thus each of these cylindrical layers

of incurvable tissues acts in this case as if the only side of the cylinder whose force predominates alone existed in each of them. The opposite side of the cylinder, whose antagonising power of incurvation is overcome, would only act here as a moderator of the action; it is precisely what happens.—Experience has convinced me that in leaves, as in flowers, the tissue incurvable by endosmose is the sole agent of the expansion, and that the tissue incurvable by oxygenation is the exclusive agent of sleep.

These two incurvable tissues, arranged, as I have described, in two cylindrical layers inclosed one within the other, doubtless act throughout the mass of the cylindrical layer or of the hollow cylinder which they form. But only the strongest of each of these hollow cylinders manifests its action exteriorly, and that by the excess of its force on that of the other sides of the same hollow cylinder. I have observed that the expansion of leaves always takes place by the action of the strongest part of the cellular tissue of the petiolary curvature. Hence this cellular tissue incurvable by endosmose is the undoubted agent of the expansion of leaves. Their sleep is certainly owing to the sole action of the fibrous tissue incurvable by oxygenation, contained in the same petiolary curvatures, for I have ascertained that by depriving leaves of respiratory oxygen their sleep is prevented; they remain always expanded, as I have also proved to be the case as regards flowers. Then the fibrous tissue incurvable by oxygenation, and the unassisted agent of sleep, is paralysed.

The phenomena of the expansion and closing of leaves, at first sight apparently very] complicated, are thus subject to the simple laws which cause the sleeping and waking of flowers.

The petiolary curvatures of the leaflets of *Robinia pseudo-acacia*, and the leaf of the Licorice (*Glycyrhiza glabra*) present sufficiently accurately the same organization as that described in the Kidney-bean. The petiolary curvature situated at the base of the petiole of the Sensitive-plant (*Mimosa pudica*, LINN.) is different. Its fibrous tissue, the agent of sleep, directs its concavity towards the centre of the petiole, which takes place in the same manner as in the other plants mentioned. But, contrary to what happens in these same plants, its cellular tissue, the agent of expansion, directs the concavity of its curvature towards the centre of the petiole, like the fibrous tissue. Since expansion is a straightening action, as in the leaves of the plants alluded to, there should be, in the petiolary curvature of the Sensitive-plant, an inversion in the position of the predominant side of its cellular tissue, the agent of expansion; this is also what takes place.

This fibrous tissue, incurvable by oxygenation, being, in the Sensitive as in other plants, the agent of sleep, and the incurvation of sleep being in it the same as the incurvation taken under the influence of stimulants, it follows that it is

this tissue which acts when excited, insomuch that what is termed "vegetable irritability," is found to belong to a fibrous tissue which acts by oxygenation and by curvature. The word *irritability*, which has no precise meaning, ought therefore to be here replaced by *incurvability*, adding that this *power of incurvation* is associated, in the case under consideration, with *excitability*, or the power of receiving the influence of stimulants, which govern the action of the incurvable fibrous tissue.—*Annales des Sciences Naturelles, Tome Sixième, pp.* 185—9.

CHAPTER OF MISCELLANIES.

As notices on Natural History published in provincial newspapers are only locally read, and meet the eyes of very few *naturalists*, we consider them almost equal in value to similar paragraphs supplied by our correspondents, if properly authenticated, or bearing the stamp of truth. We therefore take every opportunity of collecting these scattered facts, invariably acknowledging the sources from which they are obtained.—Ed.

ZOOLOGY.

Oological Cabinets.—At page 167 of the second volume of *The Naturalist*, your valuable correspondent, Mr. J. D. Salmon, is so kind as to give us some instructions on mounting birds' eggs. It would impart much additional value to his communication if he would inform us of the relative depths that he has his drawers, as it would give the tyro considerable assistance, in ordering a cabinet. I have seen a small collection in Liverpool, in which the eggs were placed on mahogany sawdust, which can be procured from the cabinet-makers. It is very fine, and I thought the colour gave great effect to the eggs; and by forming in it a slight depression for the specimen, the security is materially increased.—T. B. Hall, *Woodside, Liverpool, Feb.* 3, 1838.

Rare Birds captured during the late Frost.—The late severe weather has given our townsman, Mr. Henry Bluett, an unusual opportunity of adding to his fine collection of birds. Last week a female Goosander (*Mergus merganser*) was brought to him, and within two days after he was furnished with the Red-breasted Merganser and the Blue-winged Shoveller, deemed by ornithologists the most beautiful of the Duck tribe. They are all rare birds, especially the Red-breasted Merganser.—*Taunton Courier, March* 7, 1838. ["Blue Shoveller" is merely a provincial name for the Common Shoveller (*Spathulea clypeata*), and the Red-breasted Merganser is the well-known *Mergus serrator* of Linnæus.

Although specifically termed "Common," the *Taunton Courier* is perfectly correct in stating the Shoveller to be a rare British bird; and the designation is only applied in this, as in too many other instances, from the supposed or actual want of a better appellation.—Ed. *Nat.*]

Weaver's Museum at Birmingham.—Some years ago we had the pleasure of inspecting this fine collection, brought together by the zeal and assiduity of a poor tradesman, who opened his museum to the public daily for a small sum. Great, however, as was his ardour in the cause of Natural History, and arduous as must have been the task, to a man in his station of life, of collecting and preserving the numerous, beautiful, and frequently valuable objects which filled his large room, Mr. Weaver appeared in many respects but ill satisfied with his altered mode of existence, and even then contemplated, if we mistake not, disposing of his museum. Since the collection not only formed one of the many "lions" of Birmingham, was not only an ornament to the town and an honour to himself, but became celebrated over the whole country, Mr. Weaver's townsmen would naturally feel desirous of making an arrangement for permanently retaining the museum in their possession. From whatever cause arising, it seems that Mr. Weaver has disposed of his collection, as appears by the following announcement in the *Leamington Chronicle* of Feb. 8, 1838:—

"We sincerely congratulate the public that Weaver's valuable museum will be preserved entire to the town and neighbourhood. Through the exertions of Mr. Sands Cox, arrangements have been made to connect the whole with that belonging to the Royal School of Medicine and Surgery, and the two combined cannot but form one of the most interesting and unequalled collections in the Provinces."

We have pleasure in recording the names of those individuals who have honoured themselves by assisting Mr. Cox in his laudable endeavours:—Earls of Stamford and Warrington, Dartmouth, Howe, Bradford, Mountnorris; Lord Calthorp; Sir J. Mordaunt, Bart., M.P.; Sir F. Lawley, Bart.; Sir C. Throckmorton, Bart.; Sir E. E. Wilmot, Bart., M.P.; Evelyn Shirley, Esq., M.P.; W. S. Dugdale, Esq., M.P.; J. Scholefield, Esq., M.P.; the Dean of Lichfield; the Rev. Chancellor Law; the Rev. Egerton Bagot; the Rev. T. Gisborne; the High Bailiff; John Gough, Bolton King, James Taylor, E. Johnstone, and J. E. Piercy, Esquires.

Some time since, Dr. Shirley Palmer, of Birmingham, published a catalogue of Mr. Weaver's museum. We should be glad if any correspondent could inform us the reason of Mr. W.'s secession from the proprietorship of a collection which reflected such credit on himself as an individual, and on Birmingham as a town.—Editor.

How to drown a Fish.—Although the bare idea of drowning a fish may

appear to many an utter absurdity, the thing is not only possible but easy. It is true that fish are perfectly helpless when out of their proper element, and will not drown when afloat if left to the guidance of their own instinct; but if a Grilse, Salmon, or Trout, or in short any other species of fish, when newly taken from the net, is held with its tail up and its snout down the stream, it drowns, we understand, almost immediately. This experiment has been often tried, and, but that a thump on the head is easier, would be resorted to by piscators, for the purpose of putting finny captives to death.—*Dumfries Courier.*—Were it not for the risk of the Salmon escaping, it would be well to drown them all after they are taken; for it is a well-known fact that the "thump on the head" tends very much to deteriorate the quality of the fish.—*Taunton Courier*, *March* 7, 1838.

The Hooper Swan.—Last week a fine specimen of the wild Swan (*Anas cygnus*) was shot by A. Bosville, Esq., at Thorpe, near Burlington; it was seen quarrelling with the tame Swans, and was approached with difficulty.—*Doncaster Gazette*, *Feb*. 23, 1838.

Last week a flock of twelve or thirteen Swans passed over Runcorn, and alighted in the river. They were very low, and a most beautiful sight to those near.—*Id*., *March* 2.

Mr. Reid, of this town, has now under his hands more than a dozen wild Swans, which have been shot chiefly in the surrounding neighbourhood, besides a great number of other rare birds, of various descriptions, killed during the storm.—*Id.*

Last week a wild Swan, weighing 22lb., and measuring eight feet five inches from the extremities of the wings, and five feet from the beak to the tail, was shot near Bawtry.—*Id.*

Considerable numbers of wild Swans have been shot during the recent winter in almost every part of the kingdom, these birds being always comparatively abundant with us in long and severe seasons. We have ourselves noticed several small flocks in this neighbourhood; and on the night of March 14, two individuals were observed to attack the tame Swans on the water in Campsall Park. The majority of the specimens recently captured doubtless belong to the species termed the Hooper or Whistling Swan (*Cygnus ferus*, Ray); and although we have not been positively informed of the occurrence of Bewick's Swan in the early part of the present year, we feel very little doubt but several have visited us, and probably at this time ornament the museums of some mere collecting naturalists. We shall be happy to receive any notice of the appearance of *Cygnus Bewickii*, which is at once distinguished from its British congener by being very considerably inferior in size.—Ed.

Entomological Notes.—I have got a Moth from Dover which I cannot make

out whether a *Crambus* or a *Phycita*. The shape inclines me to think the latter, but in colour it is very similar to *Crambus argyreus* and *C. lythargyrellus*. My pair of Russian *Colias europome* agree with those in the Linnean Cabinet. Mr. Reid, of Doncaster, has several foreign specimens of both sexes, but quite distinct from *Colias philodice*. *Hesperia comma* is plentiful near Hull, and at Gogmagog Park. *Thecla pruni* is common near Doncaster, according to Messrs. Reid and Simmonds. Two specimens of *Th. virgaureæ* (♂) were taken in Horningsea Fen four or five years ago. Mr. Fox had one and Mr. Wenman the other.—J. C. Dale, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

Effect of the Drainage of Fens.—The Ancholme Cars were once famous for wild fowl, but (thanks to the drainage) of late years we have seen corn grow and Sheep graze where they used to swim, and began to think that we should have to convert our fowling-pieces into shepherd's crooks and reaping-hooks. The severity of the season, however, has brought back an abundance of the feathery tribe to their "watery hunts," and every old firelock has been called into requisition, and several Swans as well as other birds have been shot and captured, to the no small gratification of our lovers of shooting.—*Doncaster Gazette, Feb.* 23, 1838.—[*Mere* ornithologists are apt to make bitter complaints of the natural effects of drainage and tillage on their favourite pursuit; but the really philosophic naturalist, while regretting the disappearance of a few of his feathered friends, otherwise views the changes in his native soil with unmixed satisfaction, as pointing out the progress of wealth, civilization, and happiness.—Ed. *Nat.*]

Royal Poacher.—Much devastation has been caused among the Hares and other game in the neighbourhood of Beningborough, Newton, &c., for upwards of a week past, by the sportive flights of a large Golden-crested Eagle, which during the storm had forsaken his more elevated domains to exercise his sovereign rights in these parts. Royalty, however, was not considered sufficient to give him a *legitimate* claim to the game of these manors, and, besides, sundry other acts of rapacity were attributed to him, perhaps not strictly accordant with truth, such as occasionally diversifying the provisions of his royal table with a Goose, a Sheep, and (so far did exaggeration go) that it was also gravely averred he made too free with a calf. In consequence a pretty close look-out has been kept, and various methods have been tried to secure the royal stranger. Guns were pointed against him, but in vain—none had within their barrel the *charmed bullet* that could bring him down as he soared in his pride of place. Traps of different kinds were set, but they were too weak to keep him in their toils. At last, however—as man still asserts his right to dominion over the beasts of the field, and the fowls of the air—a person in the neighbourhood of Newton bethought himself of an old man-trap, which had been for some time out of use. This was duly set, and having a Hare fastened to it as a lure, the Eagle pounced upon it on Sunday

evening last, and the spring closing upon him, broke his thigh, and thus the royal captive was detained, until Mr. Tindal, the head keeper, was sent for to take possession of him. He is a fine bird, and though not particularly large in the body, measures across the wing, from tip to tip, eight feet all but two inches. It is now at Beningborough Hall, the seat of Viscount Downe, where it will be preserved.—*York Courant*, *Jan.*, 1838.—[From the size of the bird here alluded to, and from the name given it, we presume it to be the Golden Eagle, *Aquila aurea* of Willughby, *A. chrysaëtos* of Linnæus and succeeding naturalists. The Golden Eagle has very rarely been observed in England, and therefore it is highly desirable that such a notice should not be anonymous.—Ed. *Nat.*]

The Dromedary breeding in England.—The female Dromedary (*Camelus dromadarius*), one of a pair of about five years of age, and which have been in this collection for nearly two years, has recently bred at the Zoological Gardens, being the only instance of the kind in Europe. The young one, which is a female, is now five weeks old, stands about five feet high at the top of its hump, and is remarkably vigorous and healthy. The arrangements for protecting the Giraffes from the inclemency of the winter are complete, and most of the other animals have been removed to their winter quarters. The former animals enjoy good health, and are in remarkably fine condition. They appear to have become almost acclimatised, and one of them has grown nearly three feet taller since their arrival in this country.—*The Guide*, *Oct.* 11, 1837.

Red-necked Grebe in Cumberland.—A Red-necked Grebe [*Podiceps rubricollis.*—Ed. *Nat.*], a fowl of the Diver tribe, was shot on Tuesday last, in the sea, near Ulverston. The Grebe is very rarely met with in this part of England. —*Carlisle Journal, as quoted in the Doncaster Gazette*, *Feb.* 23, 1838.

Grouse near Richmond during the Frost.—In conseqence of the inclemency of the season a quantity of Grouse [Which species?—Ed. *Nat.*] have been seen near Richmond, in search of provender. Last week one of these birds was shot near that place, in a thorn bush, whilst picking the haws.—*Doncaster Gazette*, *Feb.* 23, 1838.

Singular Mode of Taking the Stork.—On Saturday week, a beautiful wild Stork was discovered upon the Park House estate, near Haversham, by Mr. John Dobinson, sen., who having heard it authenticated that the Stork, though very wild, had been taken by fright, thought proper to try the experiment. He therefore endeavoured to keep out of sight until more near his game. When he uncovered his head, the bird became as it were petrified and motionless, and allowed Mr. Dobinson to take it up.—*Westmoreland Gazette, as quoted in Manchester Times*, *March* 10, 1838.

Albinism in a Swallow.—One of our Magazines announces that there is preserved in the museum of Carcassone, a young Swallow of the purest white,

without a feather of any other colour, and which was recently killed in that city This bird was one of a brood of four, of which the three others were of the common kind. It presents in the most perfect manner all the characters of albinism: the claws and beak are red, and the same colour surrounds the eyes.—T. B. Hall, *Woodside, Liverpool, March* 1, 1838.

Occurrence of the Garrulous Roller (*Coracias garrula*) near Scarborough.—In 1832 one of these accidental stragglers—a bird of exquisite beauty—was shot while feeding upon a heap of manure in a Turnip-field at Seamer, four miles from Scarborough, and was purchased for the museum of that town.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

The Hooper Swan.—On Tuesday last, at Crabbet Park, Sussex, the seat of F. S. Blunt, Esq., fourteen wild Swans came and settled upon the lake in front of the house. Mr. Blunt, with a single ball in his gun, levelled and killed two of them; one measured eight feet across the wings, and weighed 19lbs.; the other weighed 13lbs.—*Star in the East, Feb.* 10, 1838.—[Dr. Fleming gives the weight of the adult Hooper Swan as 25lbs. The difference between the weight of the two individuals mentioned in the above extract is remarkable. The frozen state of the lakes and meres in every part of the country would account for a certain loss of flesh, but so considerable a discrepancy in two individuals shot out of the same flock seems inexplicable, unless—which is scarcely probable—the smaller bird should turn out to be Bewick's Swan.—Ed. *Nat.*]

Pigeon frozen on its Perch.—A circumstance perhaps unprecedented in the annals of freezing, was discovered here last week. A person found in this neighbourhood (Crieff) a wild Pigeon literally frozen to the branch of a tree, and so intense was the freeze, that the individual cut the branch, and carried the Pigeon home in that state alive.—*Scotch Paper, Feb.* 13, 1838.

Kingfisher frozen to Death.—On Saturday last, a Kingfisher, handsomely feathered, was discovered with its claws frozen to the bough of a tree on the canal side, near this town. It was quite dead; and attached to each claw was a piece of ice.—*North Derbyshire Chronicle, Feb.* (?), 1838.

Red-breasted Merganser.—A fine specimen of the Dun Diver was shot at Rossington, on Friday last, by John Elvidge, the game-keeper of the Rossington manor, and may be seen at Mr. Hodgson's, game-dealer, in St. Sepulchre-gate.—*Doncaster Gazette, Jan.* 19, 1838. [By the "Dun Diver" we *presume* the Red-breasted Merganser (*Mergus serrator*) is meant.—Ed. *Nat.*]

Instance of extraordinary Fecundity in the Sheep—Mr. Rawlings, of Stogursey, Somersetshire, had a ewe that last year produced *six* lambs, and all lived; this year the same ewe produced *five* lambs, but all of which, as well as the ewe, died.—*Taunton Courier, Feb.* 14, 1838.

The Death's-head Moth.—One of these monsters of the insect world was

captured on Thursday evening last, near Close House, the residence of Mrs. Bewick, near Newcastle, and has been presented by that lady, in a state of the finest preservation, to the Natural History Society, Newcastle, to be deposited in the museum. The Moth, about eight o'clock in the evening, probably attracted by the light of the fire, flew into the house of Mr. Clarke, the gardener. When on the wing it resembled, in size, a Bat, its body being of considerable circumference, and upwards of two inches long; whilst its wings, when extended, are upwards of five inches across.—Mrs. Clarke and her family were much alarmed, but Mr. Clarke shut the door, and set to work to capture the intruder. When pursued, its scream resembled that of a Mouse, but it was eventually taken without having received the slightest injury. It proved to be a fine specimen of the Death's-head Moth, so called from its having, immediately behind its head, a large and perfect figure of the head of a human skeleton. The representation of the "Death's-head" is bone-coloured, surrounded by a black ground, which brings the colour out prominently. The place of the "lack-lustre eye-holes" of the skull are represented by black spots, and the sunken cheeks of this natural *memento mori* are rendered prominent by a darker shading. The body and wings of the insect are beautifully marked, and such perfect specimens of the Death's-head Moth as the one under notice are, we believe, in this country very rare.—*Tyne Mercury, Oct.* 1837.

Crenilabrus rupestris found in the Frith of Forth.—The storm of the 24th and 25th of February, although productive of disastrous consequences in several places, has afforded many rare marine productions to the active naturalists. In the vicinity of Leith especially, and for many miles down the Frith of Forth, the whole beach above tide-mark was completely covered with the wrecks of the bottom of the ocean. The number of shells—principally the common *Solen siliqua*—was really wonderful. Among the *Crustacea*, which might have been gathered by barrow-fuls, I observed several specimens of *Galathea strigosa* and *G. rugosa*. But perhaps the rarest object which I picked up was a specimen of what appears to be Jago's Goldsinny (*Labrus—Crenilabrus—rupestris*; *Serranus rupestris* of Bloch), a fish which I believe was first satisfactorily proved to be a British species by Mr. Selby, from an examination of three specimens procured in February, 1836, one on the coast of Bamborough, the other two in Berwick Bay, and described by that gentleman in the *Magazine of Zoology and Botany*. Since then Mr. Thompson, of Dublin, has recorded, in the same periodical, the capture of two others, taken in September, 1835, at Bangor, in the sister Isle. In Mr. Yarrell's admirable *British Fishes*, a figure is given of a very small specimen which appears to belong to this species. These are the only instances of its occurrence which I can find recorded. My specimen measures $6\frac{3}{4}$ inches in length, corresponding in size with that figured by Selby, with which it otherwise

agrees, although the transverse bands represented in his plate are not present in it, resembling in this respect those examined by Mr. THOMPSON, which, however, were of much smaller dimensions. The present species is readily distinguished by the presence of a black spot at the upper part of the base of the caudal fin, and another at the anterior part of the dorsal fin. The specimen which I procured appeared to have been thrown up from a rocky bottom. This, indeed, is the favourite haunt of the species forming the *Labridæ*, to which family the animal belongs. For its description I would refer to the *Magazine of Zoology and Botany*, Vol. I., p. 167, and Vol. II., p. 445.—JOHN MACGILLIVRAY, *Edinburgh*, *March* 12, 1838.

SIX-SPOT BURNET (*Anthrocera filipendulæ*) NEAR ST. ANDREWS.—This beautiful little Moth appears to be rare in this neighbourhood. I only know of four specimens having been taken in the district, two by myself and two by a friend. I captured one of mine in 1836, and the other in 1837 (on July 13), not far from the spot where I noticed the first specimen.—HENRY BUIST, *Law Park*, *near St. Andrews*, *March* 12, 1838.

INSECTS FOUND IN TURPENTINE.—It will doubtless be in the recollection of many of your readers that some very fine specimens of Coleopterous insects, found in turpentine, were exhibited at the Bristol meeting of the British Association; and as it may be in the power of some of your subscribers to procure specimens from that source, I have copied, *verbatim*, the directions for cleaning them that Mr. W. A. LEIGHTON, of Shrewsbury, has been so kind as to forward at the request of my friend R. TUDOR, Esq. "When the raw turpentine is boiling previous to distillation, it should be skimmed carefully, as all the insects are found in the skimmings. These skimmings are to be placed in a common earthenware or pickle jar capable of being corked; the jar, however, ought to be completely filled. The jars must then be filled up* with common spirits of turpentine, which will dissolve the raw turpentine. The good specimens may now be selected, and the bad ones, if common, thrown away. Those intended to be preserved should be placed in the best spirits of turpentine for about twenty-four hours, and corked up. In this as in the former stage, a gentle warmth may be applied, not exceeding 150°. When all the raw gum is dissolved, place them in common ammonia for a few hours, according to the species; those with hard wings bearing it better than those with soft. When removed from the ammonia, they may be set and treated as recent specimens." Mr. TUDOR forwarded to Mr. LEIGHTON three jars full for the Shropshire and North Wales Natural History Society, and which were treated in the above-mentioned

* We thought that the jars were to be "completely filled" (or, to use the words of the MS. "filled full") with the *skimmings*.—ED.

manner. Many of the specimens proved very excellent. Since commencing the above notice, I have perceived that a fine collection of North-American *Coleoptera*, obtained from raw turpentine, was exhibited by Mr. Shipster to the Entomological Society on the 5th of February.—T. B. Hall, *Woodside, Liverpool, March* 1, 1838.

The Ring Pigeon (*Columba palumbus*) during the Frost.—This species—always gregarious in winter—congregated in immense flocks during the late severe and protracted frost, remaining in company up to the close of February, long before which time they usually separate. Notwithstanding the large numbers which have fallen by the deadly tubes of gunners of all descriptions, the loss to the farmers by these *associations for the acquisition of food* has been very considerable in many places. Up to this day (March 16) we have not once this year heard the plaintive note of the Ring Pigeon echo from the grove.—Ed.

BOTANY.

Aspidium lonchitis.—In Mr. Francis's excellent little work on the *British Ferns and their Allies* (noticed Vol. II., p. 226) it is stated, that the Rough Alpine Shield-fern (*A. lonchitis*) is "scarce in England." "Nor," adds the author, "have I seen it here." I have had specimens from Settle, given to me by Mr. Benjamin Thompson, to whose kindness I am indebted for the following particulars:—"This rare and most distinct Fern grows on an elevated range of limestone hills, two miles to the north-east of Settle, Yorkshire. In this locality it is very sparingly distributed, occurring generally in small patches, each containing from two or three to a dozen fronds; its place of growth being in the fissures of rocks, or more usually among the accumulated *debris* or loose stones which occupy the mountain declivities in the neighbourhood alluded to. In very bleak and exposed situations it assumes a stunted dwarfish appearance, but when sheltered in a hollow, or beneath an overhanging rock, the fronds become luxuriant, and are by no means inelegant."—T. B. Hall, *Woodside, Liverpool, March* 1, 1838.

The Water-lily.—*Nymphæa lutea*, like *Nymphæa alba*, or White Water-lily of Europe, closes at sunset, and opens on the following day, the object being to exclude the humidity that is deposited from the air, and which, if it had access to the pollen while yet in the anther, would rupture it prematurely, and prevent the fertilization of the ovules, thereby hindering them from becoming perfect seeds. This regularity in the opening and closing of the flowers, dependent upon the intensity of light, caused Linnæus to place the Water-lily on his Dial of Flowers, and has been frequently remarked by poets as the most noted example of those plants which "dedicate their beauty to the sun."—*The Guide, Nov.* 26, 1837.

Flowers.—We have seen an estimate of the profusion of flowers which decorated the rooms in the Hôtel de Ville, at the fête given there in honour of the marriage of the Duke d'Orleans. 11,793 plants, in pots, boxes, and vases, besides 2,500 nosegays presented to ladies, were furnished by one individual, and that individual a female, Madame Augustine Copin, who is at the head of an establishment on the Boulevard St. Jacques, where her gardens are situated.—*Athenæum, as quoted in the Star in the East, Feb. 10, 1838; and subsequently communicated in a letter from Mr. Hall.*

The Season.—The following extracts as to the mildness of the season, from the provincial papers, contrast strongly with the state of the weather during the last few days:—There is at this time, in the garden of Mr. G. Robinson, of Brampton, near Northallerton, a large Pear-tree in full blossom.—*Leeds Intelligencer.*—A posy, consisting of Daisies, Primroses, Snowdrops, and other flowers, was gathered at Kirklees, on New Year's-day.—*Halifax Express.*—In a hedge at the outskirts of this town there is a Hawthorn-bush part of which is in leaf, and which wears in appearance all the freshness of summer. In the village of Smalesbury a friend of ours a few days ago gathered some full-blown Primroses. —*Preston Chronicle.*—*Sheffield Mercury, Jan.* 13, 1838.

Extraordinary Increase of a Pea.—Mr. G. Gale, of South Petherton, has a sort of Pea grown in his garden this season which proved extraordinarily productive. One Pea produced 177 pods, and on an average each pod produced six peas, thus a single pea produced 1,062 of its kind, equal to 1,062 bushels out of one bushel of seed.—*The Guide, Oct.* 14, 1837.

Cultivation of the Cranberry.—In the *Transactions of the Horticultural Society*, Mr. Milne recommends the more extended cultivation of the Cranberry. He observes, "I have been long convinced that both species may be grown with much advantage in numberless situations in this island, and have been surprised that cottagers and others, living on or in the neighbourhood of moors and heaths, covered with soils suitable to their growth, have not been advised to cultivate them for profit." According to Lightfoot, twenty or thirty pounds weight of the berries are sold by the poor people each market day, for five or six weeks together, in the town of Longtown, on the borders of Cumberland. This is a considerable sum for berries picked up from barren wastes, and in a district so thinly inhabited; and it is remarkable that the ready sale for them has not tempted some person to make the trial to supply the market in a more certain and more regular way; if they could not be consumed or disposed of in the neighbourhood where they may be grown, they could easily be sent to a great distance without being spoiled. There is one strong argument in favour of their cultivation, which is, that they may be made to grow with little trouble in places and on soils where few other useful plants yet known will grow to advantage. It may be said that the

demand for them will be limited and uncertain; but that may have been said of a number of other things of a similar nature, which now meet with a regular sale, and which the growers, of course, endeavour to cultivate according to the demand they have for them. The American Cranberry would be the easier managed, and most productive for general use; but, as many prefer the flavour of the English Cranberry, there would also be a demand for it.—*Id.*

THE ALDER TREE.—The Alder is much valued in Germany for its great usefulness. Its flowers constitute the panacea of the country and town people over the whole north of Germany. They are carefully dried in airy rooms, but so that the rays of the sun cannot fall upon them. Two flowers, upon which a pint of boiling water is poured, give a tea of an agreeable taste and flavour, which, for its diaphoretic qualities, is considered as the best remedy for all disorders of the stomach, of colds, coughs, hoarseness, influenza, and all rheumatic complaints.—*Id.*

Agave Americana.—We understand that the fine specimen of this magnificent exotic, in the ladies' flower-garden, at Clowance, the seat of Sir JOHN ST. AUBYN, Bart., is now in a state of blossoming, and upwards of 200 of the flowers are expanded; and so richly are these blossoms supplied with honey, that it actually drops from them. From the vast number of flower-buds, there is no doubt but this most curious and interesting flower will continue in bloom for the space of five or six weeks. No fewer than 1,360 persons have already seen and admired this most beautiful plant, and we have every reason to believe many hundreds more will be added to the number.—*Id.*

GEOLOGY.

VISIT TO THE SALT-MINES AT NORTHWICH.—Through the medium of *The Naturalist* (Vol. II., p. 476) we have been furnished with very interesting details of the excursions to Knowsley and Leasowes, by a "MEMBER OF THE BRITISH ASSOCIATION." Could not some of your correspondents also supply the readers of your Journal with an account of the visit to the Salt-mines at Northwich?—T. B. HALL, *Woodside, Liverpool, March* 1, 1838.

TEREDO IN FOSSIL WOOD.—In my collection of fossils from the Iquanodon Quarry, Maidstone, I have a group of *Teredo* in fossil wood, and in some of the valves is seen a spiral shell of, I believe, an unknown species. It appears much like the mealden formation. Their occurrence is very remarkable, as I never met with a specimen of this spiral shell detached from fossil wood in the green sand, and I have no other way of accounting for their presence than supposing, that they had inserted themselves when the wood which contained the *Teredo* was floating towards the sea, the exuviæ of which surrounded the fossil in question. An elucidation of this opinion presented itself to me last summer, when inspect-

ing some Barnacle-shells upon the starlings of Rochester Bridge. Upon looking closely I found that many of them contained within their valves a small spiral shell—the Common Periwinkle [*Turbo littoreus*, Linn.—Ed.]—and it appeared to me that they had either destroyed the Barnacle and taken possession of its shell, or had crept into those which had died from natural causes.—W. H. Bensted, *Maidstone*, *Feb.* 7, 1838.

Petrescent Tree.—On Tuesday last, the stone-getters at the Oak Bottoms Stone-delph, Breightmet, near Bolton, discovered a tree about thirty feet long and forty inches in circumference, in a petrescent state, in a solid rock, about forty feet from the surface of the earth, and at least thirty feet beneath the strata of rock. The inside of the tree is completely petrified, and covered with an incrustation of carboniferous matter.—*Sheffield Iris*, *March* 13, 1838.

METEOROLOGY.

Meteors on the Nights of Nov. 12—14.—It has now been observed for nearly forty years that an astonishing number of meteors are always to be seen during the nights of the 12th, 13th, and 14th of November. Alexander Von Humboldt has inserted an advertisement in the Berlin papers, suggesting to scientific men in different parts of the world a variety of observations, with a view to ascertain whether this phenomenon is not in some way connected with telluric magnetism.—*The Guide*, *Oct.* 14, 1837.—[These are the peculiar meteors termed " shooting stars."—Ed. *Nat.*]

Patrick Murphy, Esq.—*The Sumbeam*, No. vi., for March 10, contains a portrait and brief notice of Mr. Murphy, the gentleman after whom thousands and hundreds of thousands of persons went mad a few short weeks ago, and who is now all but forgotten. If Mr. Murphy's theory should yet prove true, the history of his scientific career will only add another to the already numerous and instructive instances of the neglect and contempt with which new discoveries—however important— are treated as well by the learned as the ignorant. We are glad to find that the *Cheltenham Looker-On* continues steadily to compare the prophecies of Mr. M. and the actual state of the weather. The *Monthly Chronicle* for March contains some specious objections to Murphy's nomenclature, and which, did we think they could mislead any reflecting individual—we should not fail to expose.—Editor.

REVIEWS OF NEW PUBLICATIONS.

Observations on the Meteoric Shower of November, 1837. By DENISON OLMSTED, Professor of Astronomy and Natural Philosophy in Yale College. Newhaven: *R. L. Hamlen.* 1837. 8vo. pp. 16.

THIS treatise appeared originally in the thirty-third volume of the *American Journal of Science and Arts.* Whether or not it is thus early brought to a second edition at the "request of friends," or for more recondite purposes, does not transpire; but the great interest of the subject, and the manner in which Professor OLMSTED and his pupils have conducted their joint researches, appear to us sufficiently to warrant the republication of the facts. As the essay is already tolerably condensed, and as it would scarcely be fair to analyse our author's observations too minutely, we shall, instead of supplying a *third edition* of his paper, content ourselves with noticing a few of the most interesting circumstances mentioned by the writer and his correspondents.

Professor OLMSTED and his young friends appear to have seen more shooting stars on the night of Nov. 12 than were noticed in other quarters, on which subject our author observes:—"To some who have averred that there were on that night few or none to be seen elsewhere, but have ascribed the favours so much more freely bestowed here to the courteous attention paid them on former visits, we would respectfully recommend, that hereafter they use the ceremony to meet these celestial visitants out of doors, and in full dress. A constant gaze with the neck bent backwards, for six hours or more, in a frosty night, is the kind of etiquette they exact."

No shooting stars were observed till five minutes after one o'clock, and from that time till seven o'clock 230 were noticed, or, deducting four meteors which—as was afterwards found—had been counted twice, the exact number was 226. The greatest number were seen in the south-east, and the fewest in the south-west, the proportion being as three to one. On the whole the largest number occurred from four to five o'clock, although this was not the case invariably, when the several quarters were examined separately. The maximum of the shower has in former years invariably been at about four o'clock. Frequently several meteors started at the same time and from the same part of the heavens, falling, however, in different directions.

Seven meteors were observed to *rise.* All the meteors, except ten or twelve, proceeded in directions diverging from the constellation Leo. Those which did

not follow this course were marked by the professor as unconformable. They had generally a slower motion than the others, particularly when moving horizontally from west to east.

A full moon was shining so brightly that no stars below the third magnitude were visible, and therefore only very brilliant meteors could be seen at all. About forty were of such size and splendour that they might be compared to Venus and Jupiter, and in a dark night they must have been splendid fire-balls. Many, on the contrary, were mere momentary flashes. Most of the meteors were followed by trains. In most instances these appeared to be merely the continued impressions of light on the eye, just as we often fancy we perceive the flame of a candle after it is extinguished, in a dark room; but in many cases the train remained visible so long as to leave no doubt of its being an actual deposit of luminous matter.

The velocity of most of the meteors was surprising, their transit frequently occupying not more than a quarter of a second, and seldom exceeding a second. It has previously been stated that those which passed horizontally from west to east had a comparatively slow motion, in corroboration of which we may observe, that on the evening of Nov. 16, at 10h. 25m., Professor O. saw a large dull red meteor sailing along the southern sky from west to east, at an elevation of 20°, which occupied ten seconds.

Thus far the personal observations of our author and his young friends. At New York no shooting stars were seen till two o'clock, from which time till sunrise 70 were counted, many of them extremely brilliant, and followed by trains. The point of radiation was nearly, if not quite, the same as in 1836. Another observer counted from 40 to 50 meteors between the hours of two and six. Many of the fainter kind were excluded from the estimate. The display continued until all the stars were swallowed up in the broad light of day.

At Emmittsburgh (Maryland) the first meteor was seen at twelve minutes past one, the number gradually increasing up to half-past four, when they were most numerous. From a quarter to four till five o'clock 52 meteors were counted.

At Buffalo (New York) the heavens were entirely obscured by dense clouds.

At Western Reserve College (Ohio) the view was interrupted by the same misfortune till a quarter before three, when the sky was clear until twenty-three minutes before five. During this interval 74 shooting stars were counted, the greatest number being seen in the south-east, and the least in the north-west.

Shooting stars are generally supposed to occur chiefly between the 13th and 15th of November. Hear Professor Olmsted on this point:—

"It is granted that shooting stars occur in greater or less number at all seasons of the year, and that they are usually frequent in every clear night in the autumnal months; and before we are authorised to infer any remarkable exhibition of them on the morning of Nov. 13 of the present year (1837), it is necessary to compare the phenomena as observed on that morning with such as were observed on the mornings preceding and following that."—p. 9.

A comparison is then instituted between the meteors of Nov. 13 and those of the preceding and subsequent days, illustrated by a table. But for this and all further particulars we must refer our readers to the pamphlet itself, or to the paper in the American periodical.

A History of British Birds. By WILLIAM YARRELL, F.L.S., V.P.Z.S. Illustrated by a Wood-cut of each Species, and numerous Vignettes. London: *John Van Voorst*, Paternoster-Row. Part v., March, 1838.

THE part before us contains the Song and Redwing Thrushes, the Ouzels, the Golden Oriole, the Dunnocks (*Accentor*), the Robin Redbreast, the Blue-throated Fantail, and the Common Redstart. The figures of the Black Ouzel and the Robin Redbreast are the best in the number, and the vignettes are very good.

We have received a letter from a correspondent respecting the character of the wood-cuts in this work. We shall place the epistle before our readers next month, until which time we postpone all further observations on the publication.

The Phrenological Journal, and Magazine of Moral Science. Vol. XI.—No. LV. New Series, No. ii. March, 1838. Published quarterly. London: *Simpkin, Marshall, & Co.*; *Maclachan & Stewart*, Edinburgh.

AMONGST the numerous periodicals of one kind or another transmitted to us weekly, monthly, and quarterly, there are very few in which we have time or inclination to read more than a few pages, or rapidly to skim their contents. But the *Phrenological Journal* has always been a favourite with us; and we cannot more forcibly express our approbation of the present number than by stating that we have attentively perused every paragraph of its contents. Ever a valuable and an interesting work, we cannot but think that it has improved in more ways than one under the conductorship of Mr. H. C. WATSON. In the first place, the Journal has ceased to be the organ of a party; 2nd., the arrangement of the contents is superior to that of former Nos.; and 3rd., there is considerably more unity of style and sentiment in both the editorial articles and the general tone of the periodical. Under these circumstances it is not surprising that the work should prosper, and that the first edition of No. i. (N. S.) should have disappeared shortly after publication.

Phrenology still continues to have its retarders, as well among its would-be

friends as its declared enemies. Such retarders as those of the latter class must be are truly too contemptible to merit more than a passing notice of pity. Some eighteen or twenty years ago there was some excuse for the anti-phrenologists. Phrenology being at that time opposed by the great bulk of eminent scientific men, and almost unknown, even by name, to the majority of our country-men, original observations and careful deductions were required to test its truth, and new and apparently plausible objections might be raised against its pretensions. But at the present day the face of affairs wears an entirely different, and, to the lover of truth, a far more cheering aspect. Now that the phrenologist can adduce thousands of facts in support of his system, and capable at the same time of demolishing every argument against it, no one is excusable for remaining wholly ignorant of so important a branch of knowledge, or for attempting to overthrow it—like too many of our opponents—without consulting either the facts of friends or the fancies of foes to the doctrine. In short, those who propose reiterating the stale and vapid arguments against Phrenology for the thousand-and-first time, might receive satisfactory replies to each and all of their objections from the merest tyro in the science—replies that would render a man of ordinary candour and strength of mind desirous of making every amends for having so long opposed the assistance of so clear and pure a source of light.

The *Phrenological Journal* has probably contributed little to *popularize* the science to which its pages are devoted, but that it has turned many bitter opponents into zealous adherents and ardent admirers of Phrenology, and that it has greatly advanced the subject *as a science*, and proved a valuable chronicle of passing events connected with the subject, during a period of fifteen years, can, we think, admit of no reasonable doubt. The new series, as we have already intimated, bids fair to eclipse even the old, and we trust that the present Editor will not relax his judicious and hitherto highly successful endeavours to render his journal as worthy of its title and objects as possible.

Numerous as are the subjects treated of in the number lying on our table, the work contains little that would be interesting to the mere zoologist, that is, to the zoologist who feels no pleasure in investigating the natural history of the highest of the animal series—Man. He who prides himself upon studying Nature (*i. e.*, animals, plants, minerals, &c. &c.), and who despises the occupations of the schoolmaster, the psychologist, and the novelist, never dreams that their study is Nature as well as his own, but in a *higher department*, and that it is not the less so because modified by various and almost infinite circumstances. While the principal business of the majority of naturalists is to observe facts, a good schoolmaster or a first-rate novelist has need of an ample development of the same faculties *in addition to others which are far more important.* In making this statement, some may suppose that we are depreciating Natural History commonly

so-called, and thereby lowering our own dignity. Such an argument may hold with those who consider their dignity to consist in upholding their favourite pursuits at all hazards; but we conceive that the man of true dignity will lose nothing by openly facing the truth, which, in fact, ought to be his main supporter on every occasion, whether or not such conduct may apparently militate against his interest, falsely so named. If a man's interest consist solely in getting money, or in obtaining the applause of mankind, then indeed he need be no lover of truth; but he who has the true interests of his fellow-creatures at heart, will not fail, on any account whatever, fearlessly to publish his sincere opinions to the world, and by so doing he will be insuring what *ought to be* the interest of every one. Thus Natural History requires no garbled statements or adventitious assistance to prove either its uses or its importance. What we oppose is the assumption that there can be nothing loftier than that study.

Whilst on this subject it may not be amiss, or altogether unprofitable, to make a few observations upon two editorial passages which occur at p. 221 of the Journal before us. In justly reprehending the omission of all notice of Phrenology in the *Penny Cyclopædia*, Mr. Watson remarks:—"But who can doubt the existence of these defects, if aware, that while the sciences of Entomology, Ornithology, and others comparatively of little value, are largely entered upon, the most important of all sciences—that of the human mind—is scarcely spoken of?" Again:—"We know not whether it is from contempt of the Society itself, or from contempt of the science to which it relates, that the Phrenological Society of London has been omitted by the compilers of the *British Annual.* Some other of the London scientific societies have been equally passed over; but the omission of the Phrenological Society becomes more remarkable by contrast with the admission of another whose objects are comparatively contemptible—the Entomological Society; which is introduced into the *Annual* for 1838, with lists of a President, four Vice-Presidents, and a host of other officers." Now we have freely and fully acknowledged the superior importance of Phrenology to Natural History; but, for all that, we never could bring ourselves to designate either Ornithology or Entomology even *comparatively* "contemptible." It is, certainly, an ungracious mode of expressing the relative importance of the studies.

Zoology, for example, is unquestionably a higher department of Natural History than Botany, since it treats of *living beings*, higher in the range of created things than the latter science; but so zealous a botanist as Mr. Watson would probably be surprised were we to stigmatize Botany as contemptible in comparison to Zoology. And justly so. For although the study of the vegetable creation *may not* assist us in money-getting or in obtaining food, it cannot, when properly investigated, but lead to the best results. Many persons consider the Fine Arts "comparatively contemptible"—"mere ornaments and baubles fit alone for the

weak minds of young ladies," when in fact it is the development of the object-or that is really contemptible, as being unable to appreciate what may perhaps be regarded as the most ennobling, soul-inspiring and civilizing pursuits that can engage the mind of man—pursuits that have occupied the attention of some of the most gifted and philosophical men of all ages and all countries—that ever have and ever will prove a source of the purest and most thrilling pleasure to thousands of individuals in every part of the world. These pursuits may indeed be stigmatized as useless, contemptible, or pernicious, by those who believe that to gain everlasting happiness hereafter we must be miserable here, or that only those occupations can be advantageous which stimulate and exercise our inferior faculties. With such men we confess we have nothing in common. We entertain a loftier idea of the beneficent Creator than to believe that he delights in beholding our misery, or that he intended us to deny ourselves the due exercise of any of those faculties which have been assigned to each and all of us, and the enjoyment accruing therefrom. We hold, that whatever tends to minister to our *real* happiness in this fleeting world, equally ensures the attainment of that which will be enduring. Now the study of the wonderful and endlessly-varied works of Nature, abounding as they everywhere do with proofs of the wisdom and all-prevailing intelligence of the Artificer of the Universe, cannot but tend to improve our minds and add to our happiness both in this spot of earth and in the far more glorious state of existence in which, by reason of the superiority of our organization, sickness and sorrow will be alike unknown, when the interests of one will be those of all, and when both friends and foes shall meet to part no more.

With this high aim in view, we object to the term contemptible, as applied to the study of any part of Nature's works; and although Mr. Watson, naturally carried away by the ardour of his feelings in the cause of Phrenology, probably intended no disrespect to Natural History, we would rather that the *appearance* conveyed by his expressions had been avoided, especially as there is no necessity of proving the utility of one branch of knowledge at the expense of the credit of another department.

LITERARY INTELLIGENCE.

A work entitled the *Coleopterist's Manual*, containing descriptions of the Lamellicorn insects, has, we understand, lately been published, by the Rev. F. W. Hope.

We have received a critical notice of Sir W. Jardine's *Raptores* from a correspondent; but as the work itself has not been forwarded to us, the review must not expect admission to the exclusion of reviews of publications which *have* been received. We hope to publish the critique next month.

THE NATURALIST.

VOL. III., No. XX.—MAY, 1838.

ON THE PHYSICAL POWER OF INSECTS AS LABOURERS, AND ON THEIR ARCHITECTURE.*

By R. Adie.

My object in bringing before the Society these pages, is chiefly to direct its attention to a branch of Natural Science that has always to me proved replete with objects for contemplation, where there still reign in an extensive field many conflicting opinions to be set at rest, and where the environs of the most crowded spots present us with a good supply of materials to work with. I allude to the labours of the insect race.

In conversing, some years ago, with an accomplished entomologist, well known as an author on that branch of Natural History, he assured me that at that time we were almost wholly ignorant of the functions required from many of the organs in the insect economy. He viewed them as fanciful forms; but, looking to the beautiful adaptation of the means to meet the end required, every where seen in the science of Comparative Anatomy, and thus reasoning from the analogy of the higher animals, I think it cannot be doubted, that a more intimate knowledge of insect organization will prove that all their parts have important duties to perform in the economy of the creature on which they are bestowed.

The variety and ingenuity displayed by so many of the different species of insects in their labours, have given rise to the appellation of Insect Architecture, as employed to designate this portion of their economy; and though it may seem inconsistent to term an insect's boring holes or galleries through earth or wood architecture, yet, if we look on the other hand, such a title, we must allow, is often well merited, as, for instance, in the geometrical precision of the works of the Hive Bee, the durable paper made by the Wasp, the trap constructed by the wary Ant-lion, or the beautiful life-boat formed by the Common Gnat for the preservation of its species; the latter showing a knowledge of naval architecture that men for their safety have for many ages stood in need of, but who have only recently enjoyed its benefit.

* Read before the March Meeting of the Liverpool Natural History Society.

We find, in history, frequent instances of useful ideas drawn from a careful attention to the works of the insect race.—The Wasp, it will be seen, was practising precisely the art of paper-making, on a small scale, long ages ago, when men for the want of it wrote on tables of lead, on skins, on the barks of plants, &c. I am not aware that the labours of the Wasp served to instruct us in the paper-manufacture, as they certainly might have done, but in all probability in the earlier ages of the world, when the history of the arts was hidden in obscurity, Man was often indebted to the examples set him by a large portion of the animal kingdom in their works for the preservation of themselves or their offspring. At the same time it is certain they have gathered nothing from us, unless I may be allowed to pass to a kindred branch of Natural History, to cite a singular instance mentioned by Wilson, in his *American Ornithology*, where we are informed of a bird that used to weave an intricate nest of minute fibres and roots of plants; but since the settlement of that country they have found the thread, put out to bleach by the careful American housewives, so much better fitted for their purpose, that, disregarding all the rights of property, they had become notorious for pilfering it.

Mr. Brunel, when he planned his tunnelling shield, frankly acknowledged he had borrowed the idea from a mining Beetle, whose success and industry in cutting tunnels or galleries through the earth had some time before arrested his attention.

The late Mr. Smeaton, also, in sketching the design for Eddystone Lighthouse, one of the most indestructible fabrics of human labour, was indebted to his observations of Nature's works for the external shape of his tower.

Again, to shew the necessity for the exercise of caution in proceeding with the study of natural phenomena, where we seek to ascertain for what end the work going on is designed, I may mention an error of the ancients in considering the pellets of clay, with which they often observed the Mason Bee loaded, as ballast carried by the insect to steady it against the wind. The pellets, I need scarcely say, are for no such purpose, but are solely used for the construction of the creature's nest. Cicero has left on record an equally great error in Natural History, though not immediately connected with this branch, when he speaks of the Barley-grains as surrounded by a rampart of spears to defend them from the ravages of the lesser birds—a very probable reading in Natural History for a martial age like his, but which in our times could not be passed without ridicule, save for the exquisite language in which his opinions are clothed.

The labours of insects taken collectively are of great importance to Man—not so much as his assistants, like many of the higher animals (although numerous instances are recorded to shew where he does receive essential benefit from them), but as grievances, blasting his prospects from the tender plants to which

he looks forward for his harvest crops, ruining his orchards, annoying his domestic animals, and in the warmer latitudes not even sparing himself. It may seem strange that such reasons should be brought forward to urge the necessity of our making ourselves acquainted with the works of insects, but I believe it is perfectly legitimate to do so; for it is to be remembered, that here, as elsewhere, knowledge may be power, and that with the power derived from a knowledge of their economy we may frequently see these destroyers overcome.

In primeval forests, and in countries where vegetation remains as yet unchecked by the hand of man, the labours of insects seem often as if appointed as a curb on luxuriant vegetation. In Europe, and in other parts of the world under his care, no such check is now needed; nevertheless they return as originally appointed in the order of the universe. Their appearance is often at distant intervals, and quite inexplicable; every effort is made by the sufferers from their ravages to put a stop to their devastations; and it is only by a careful attention to their economy that this can be attained. Knowing from example, as we now do, how to destroy a large proportion of the eggs of the Corn Weavel, that insect is no longer the dreadful scourge of the granary that it once was.

In the vicinity of London, in St. James's and the Green Park, a few years back, the trees were observed to be stripped of their bark; at first some wanton mischievous persons were supposed to be the cause of the injury; the RANGER launched his edicts against them, and appointed a watch to lead to their detection; the evil increased—in vain did the anxious watchman try to bring to light the offenders; it was not until an entomologist had explained the cause of the injury, and how to proceed to remove it, that the trees were restored to their wonted health. It is not always, however, that the labours of entomologists in this sphere have been so successful.

A gentleman in Liverpool, well known for his zeal in this department of science, has informed me of two interesting cases that have recently occurred in France and Germany, where the utmost skill of the naturalists of both these countries has been baffled. The Vines of Burgundy had received much injury from the attacks of the larva of a small Moth. At the urgent request of the proprietors of the Vine-yards, the French government employed Professor AUDOUIN, of the Jardin des Plantes, to see if he could provide an antidote for the evil. After a thorough investigation of the Vines, he found that the only mode of removing the insects was by placing a number of lamps on the ground at sunset, surrounding them by shallow basins of oil. The Moths, while moving about to deposit their eggs, flew to the light, and were destroyed in immense numbers among the oil; still the few that escaped possessed such powers of reproduction that the damage was felt to be very little alleviated.

The other case occurred in the Hartz Forest, in Germany. During the early

part of the summer of 1832, the Pines failed to put out their usual fresh shoots, and presently their branches were seen every where dying. Specimens of the diseased trees were forwarded to various professors throughout Germany, with urgent letters requesting them to use their best endeavours to explain the cause of the injury, and to suggest any remedy for its prevention. After some time it was found that the evil arose from an insect, scarcely visible to the naked eye, being imbedded at the root of each leaf. It will be remembered that the leaves of the Pine are small and very numerous; consequently the number of these insects requisite to produce the decay of a branch or a tree may be imagined. Where they came from, or how they could be removed, were questions for which no one offered any solution.

The physical power of insects as labourers, employing the term in its fullest sense, may be said to be one of the most destructive living agents in the present era of our planet. Sir HUMPHREY DAVY, in alluding to the physical power of insects, has said, "The most insignificant creatures triumph as it were over the grandest works of man." Also, "As the Worm devours the lineaments of his mortal beauty, so the most humble and insignificant insects shall undermine and sap the foundations of his colossal works, and make their habitations among the ruins of his palaces, and the falling seats of his earthly glory."

Insects thus serve an important part in the third step for fulfilling the gradually progressive adaptation of the materials of our world for sustaining a more luxuriant vegetation and a greater amount of animal life.

The co-operative power of Ants, as labourers, enables them to perform works of a magnitude surpassed only in the lower departments of the animal kingdom by the coral animalcule.

The habitations reared by the White Ants (*Termes bellicosus*) of tropical countries have been by some naturalists compared with the Colossal Pyramids of Egypt, to shew that the works of this insect bear a greater ratio to its size than the most lofty works of man do to his magnitude. So far as dimensions go the comparison will hold good, but when durability—which cannot be fairly excluded from such an estimate—is taken into consideration, the labours of the White Ants sink into comparative insignificence.

Bishop HEBER, in his travels in Hindostan, describes Ant-hills five or six feet high, and seven or eight feet in circumference. Other travellers mention them as high as twenty feet. Thus, these erections appear to exceed in size those of any other of the higher members of the animal kingdom.

The White Ants are omnivorous, but seem chiefly to direct their ravages against dead vegetable matter. They employ their power not only in rearing their huge encampments, but also in making covert ways in every direction leading to the objects for their attacks; and so assiduous are they in their labours

that they baffle the ingenuity of Man to save from them his valuables, pushing forward their architectural designs to the very heart of well-furnished habitations, where they without fail destroy all that is of vegetable or animal origin. Thus in the tropical regions of South America HUMBOLDT states that it is extremely rare to obtain a paper fifty or sixty years old, owing to the difficulty of excluding the White Ants.

Painful as it must be for the inhabitants of such latitudes to have to contend with an enemy they can see no hope of removing, these little creatures can only be looked upon as active and useful labourers in the work of disintegration, where the fertility of the climate calls for a more rapid conversion of dead animal or vegetable matter into the elements of reproduction.

The Ants (*Formica cæspitum*) of our own island are industrious co-operative labourers, endued with a power suited to the wants of a temperate region. The greater part of their masonic labour is performed during the night, or at least in gloomy weather; it is well ascertained that they use no other cement than water in the construction of their varied habitations; hence in dry weather many of their operations are abandoned.

In a sandy soil I found that the favourite resort for their encampments was under large thin flat stones. Galleries led in every direction from under the stone through the soil; and this covering, while it protected the nest from rain, was quickly heated by the sun's rays. The eggs are invariably placed close under it; on suddenly raising these stones, a scene of much bustle ensues, and great solicitude is displayed by the workers for the safety of the eggs and grubs, the latter being rapidly carried away through the galleries under ground. These proceedings leave a pleasing impression on the mind of the observer; and it is striking to see such tender care exercised in so small a circle. I have always found the Ants of Britain more omnivorous than their tropical brethren. In the early part of spring they attack animal matter with great avidity; any small animal placed in a large nest is soon reduced to a skeleton; and as this experiment is frequently tried, with a view to obtain a preparation of bones too tender and fragile to be easily cleaned by the ordinary methods, I may mention that I have rarely seen it succeed; for the Ants in eating away the flesh seldom spare the tenderer parts of the bone.

The Mason Ants are frequently seen dragging to their hills loads of provisions far exceeding their own size and weight. The perseverance they display in overcoming the difficulties of very rough roads has arrested the attention of observers in all ages. Hence, in the fables of old, the Ant is made to figure as a pattern of industry, frugality, and foresight.

The more strict observations of latter days have proved that Ants stand in no need of such stores of food. They pass the whole winter in a torpid state. I

have many a time searched Ants' nests in the hope of finding some kind of storehouse, to serve as a reserve in the event of a continuance of wet summer weather, but have invariably been disappointed, save in one solitary instance, where I came on a gallery filled with the debris of insects of all sorts; a closer examination of these proved that they were only the refuse, the nutritive parts being already consumed. The small pieces of bread, grains of corn, Flies, &c. &c., which at some seasons the Ants freely take from the hand, are removed to the nest for the food of the young.

Honey seems the most favourite delicacy with all of the species, more particularly that produced by the Aphides, and called honey-dew. The Ants, on removing this from the leaves of the plants on which it is deposited, materially help to preserve the health and vigour of vegetation.

The younger Huber devoted much of his attention to the labours of the Ants of Germany and Switzerland. Some of his observations are so very remarkable that, though supported by his high character for veracity, they still appear [arguing *à priori.*—Ed.] scarcely credible. Subsequent investigations, however, all tend to confirm his accuracy, although no later observers have entered into or seen so much of the detail as he has.

Huber discovered two new species, one of which he termed the Amazon Ant, the other the Sanguinary Ant. Both of these consist of communities of warriors, which make war against Ants of a different species from their own; not at all to gratify a mere love for combat, but, strange to say, for a far more mercenary purpose, viz., to make slaves of the vanquished, to be afterwards trained to do the drudging domestic work of the conquerors. The ingenuity they display in effecting this calls for the utmost stretch of our credulity. Should the observations of later years fully establish and confirm what Huber has said on this head, it will form by far the most remarkable proceeding in the co-operative labours of insects.

After a contest is decided—which the warlike Ants contrive always to end in their own favour—they do not make captives of the grown-up part of the vanquished community—no doubt because they well know these to be of a spirit too refractory to be ever available for much good—but carry off the eggs and cocoons, to rear a race in bondage that have never known the benefits of freedom.

Other naturalists have not as yet had the good fortune to witness these slave-capturing engagements, but so far have they been confirmed, that the slaves are frequently seen at work in the habitations of the warlike Ants their masters.

The Hive Bee (*Apis mellifica*) affords one of the most striking examples of the skill and power of the insect architects; their wonderful proceedings have long engaged the attention of the curious. The instructions given by Virgil for the choice of a situation for an apiary, are considered at the present time quite as

useful as any of the directions given by more modern writers. But it is to observations commenced in the last century only that we owe our knowledge of their internal economy. The works of Bees are well able to bear, and quite consistent with, the rigorous character of all modern inquiries, which are now rapidly driving from the field many fabulous accounts that had their foundation in objects of Natural History.

The most satisfactory account of the habits of Bees is grounded on investigations conducted by M. Huber—observations which, for exactness, are inferior to none, and which would of themselves be sufficient to send down the name of their author honorably to posterity; but when it is remembered, that he who guided them was deprived of what seems the very first requisite for making observations, viz. eye-sight, M. Huber's name will always stand forward in the page of history to cheer on the labourer in the cause of science for the accomplishment of a task which at first may seem far beyond his reach.

No branch of insect architecture has called forth so much admiration as the cells of the Hive Bee. Two of the ancient philosophers are said to have devoted nearly their whole lives to their study. It is but in recent times, however, that, with the aid of the most refined mathematical inquiries, we have been enabled fully to value their skill. It was first shown by the calculus, and subsequently MacLaurin, with a truly felicitous skill, as Lord Brougham expresses it, has succeeded by means of Geometry to prove, that the Hive Bee works with mathematical precision to construct a cell uniting the greatest strength and capacity with the least possible expenditure of materials. It is true the angles of the cell differ very slightly from the form of the calculated shape, but it is confidently expected that future inquiries, or a more perfect knowledge of the economy of insects, will assign a cause for the difference.

In conversing with those who are much accustomed to observe Bees, it will frequently be found that they have very little to say in favour of their architecture. The Bee is guided by an unerring instinct, which, acting, as in the other lower animals, without any discretionary power, forces it to work in all cases in one way.

The wax-workers secrete the wax and lay the foundations of the cells, by first forming a thick piece of wax; as soon as this is done, another class of Bees, called the "sculptors," proceed to excavate the bottom of a cell; sides are subsequently added to it by the wax-workers. Wherever a sculptor Bee finds a thick piece of wax, it is sure to hollow out the form of a rudimentary cell, whether or no the situation in which the wax is placed be capable of permitting the cell to be finished.

From this arrangement they frequently appear lavish of their hexagonal figures where we can see no use for them. Thus, when any foreign matter is introduced

into a hive, which the Bees are quite unable to remove, its decay and corruption might prove a source of much injury to the hive. To prevent this it is carefully shrouded with a thick coat of wax, on which the sculptors form their accustomed foundations for a hexagonal cell; the end sought for calls for no such display of geometrical skill; but that this should lessen our admiration of the wonderful instinct implanted in these tiny creatures, to guide them on the most correct principles through the great bulk of their works, can only proceed from taking a very narrow view of their economy.

In observing Bees through glass windows in their hives, I have had many opportunities of confirming the truth of M. HUBER'S observations, as to their secretion of wax, mode of working their cells, &c. &c. As an instance of their combined exertions, I may mention that I have seen a hive weigh 3lbs. more after a single very fine summer day's labour. Of this weight each of the out-door workers will have to contribute at least one grain, a quantity, it will be evident, that a Bee can have no difficulty in gathering from the choicest flowers in the course of a long day's sunshine. The average of their day's labour, however, must be taken very much lower than the weight above mentioned, and in an unfavourable wet month of summer they will sometimes be even found to lose weight.

Connected with the economy of Bees, though not relating to their architecture, is the curious noise of one of the queen Bees for two or three evenings previous to the swarm coming off; the sound is sufficiently loud to be easily heard through the sides of the hive, on a still evening, to a person close behind, listening attentively. As the sounds made by Bees and other insects have been explained (see Vol. II., p. 45) as proceeding from different parts than those of voice, as in the higher animals, viz. by the wings or other organs beating or fretting on some vibratory substance, I can only explain this singular sound by referring it to the convulsive effort made by the young queen with its wings while detained a captive in its cell for two or three days after it has attained maturity.

There are many other Bees remarkable for the architecture of their habitations; those of the Solitary Bee are next in instinct to the Hive Bee, but as none of them display the same beauty in their combs, I have preferred to confine myself entirely to the latter. The social Wasp (*Vespa vulgaris*) is an architect scarcely less worthy of the naturalist's attention than the Hive Bee. The regularity in the depth of the cells gives to the interior of the nest a uniformity that is wanting in the Bee. The cells of the Wasp are hexagonal, but as the greatest possible capacity with the least possible expenditure of materials is not so requisite for the habits of an insect which only uses the cells for breeding, and which has not to secrete the matter of which they are formed, the Wasp has been taught to work its cells with flat bottoms, which are placed uppermost.

The most curious part of the Wasp's nest is the material of which it is made, the whole being constructed of a very durable kind of paper, made by the Wasp from the raspings of decaying wood. Early in summer I have frequently watched them on wooden rails and fences exposed to the weather for two or three years, busily engaged scraping the surface with their powerful mandibles. It thus collects a small pellet of matter, which it reduces into fine fibres (after the manner of our paper-makers), and then mingles with it a gum which it secretes for the purpose; a substance is thus formed which, when spread out in thin layers, hardens, and becomes a paper well fitted to withstand the changes of the summer weather. The Wasp was thus certainly practising the art of paper-making ages before men were acquainted with this valuable process.

Spiders, although not strictly speaking insects, are still often associated with them. Their works are well deserving the attention of the lover of Nature. The geometric net of *Eperia diadema*, although framed for no very benevolent purpose, is one of the most beautiful works produced by the labours of any of the lower animals. When carefully examined it will be found that not one of the numerous stays that stretch them out are superfluous. They have engaged the attention of naturalists with a view to explain their mode of projecting those fine threads (see Vol. II., p. 376); when it was found that their emission could not be accounted for by a projectile force in the spinner, the aid of electricity was called in to answer for the cause, as it has often before been employed to explain what was imperfectly understood; but a few well-conducted experiments have shewn that the Spider possesses no power of shooting a thread unless aided by a current of wind; this any one may prove experimentally, by placing a Spider on a small straw fastened only at the lower end, and surrounded by water; put a bell glass over the insect to keep off air, and it will be found altogether unable to escape; but when a current of air passes over the Spider it immediately elevates itself and gives out a thread which is rapidly drawn along by the wind. From time to time the Spider tries with its foot to see if the thread has caught any object; when it does find the end of this thread fastened, it immediately makes use of the bridge of rope thus formed to escape, or if the current be sufficiently strong it will commit itself to it when the rope is long enough to bring the insect up.

Spiders have the credit of possessing a good foresight as to the changes of the weather; it is remarked, that many more long streaming webs are found in fine settled weather than when the weather is changeable, but it is evident that much of this may be due to the bad weather destroying more rapidly the works of these little labourers, than to their foresight in meteorological matters.

The labours of the numerous varieties of caterpillars are extremely interesting; they are also often very destructive. The time of their entering into the pupa

state is the most curious part of their history—a state that belongs more strictly to insect transformations than to their labours. I may, however, just mention that many of them, previous to this change, spin silk, of which only the cocoon of the Common Silk-worm is available for useful purposes to man. The value of this insect is much enhanced by domestication, and a careful attention to their wants. The universal application made of the material derived from it places it at the head of the direct contributors to the wants of man among insect architects.

In every branch of the works of insect labourers we perceive an infinite variety of beautiful contrivances, both offensive and defensive, all tending towards the preservation of the insect on which they are bestowed or the continuance of their species. They are guided by an unerring instinct, which instructs them in every thing necessary for fulfilling their part on this earth. "They learn nothing, they forget nothing." Such arrangements cannot but fail to strike the careful observer with the highest reverence for the Being who has implanted them in creatures individually so feeble; and in this corner of science, as in every other branch of it, we are impelled to rise with admiration to the contemplation of Nature's Author.

EXPLANATION OF A PECULIAR MECHANISM IN THE TRACHEA OF BIRDS.

By William MacGillivray, A.M., F.R.S.E., M.W.S., &c. &c.

Having lately submitted to a rather minute examination a great variety of tracheæ, with reference to a second volume of my *History of British Birds*, I have made some observations which, I trust, will be found of considerable interest, and among them the following. The trachea of birds is formed of rings connected by elastic membranes. These rings, which are generally bony, but sometimes, as in the Golden Eagle, Ostrich, and Emu, cartilaginous, differ from those of the Mammalia in being complete (excepting from two to five at the upper, and sometimes one or two at the lower extremity), although they are seldom of uniform breadth in their whole extent, the back part being usually narrower. The bronchial rings, on the other hand, are generally incomplete, and frequently cartilaginous, although in many cases they are osseous, as in Swans, and in a few complete and rigid, as in the Grebes. It is not, however, my intention here to describe the trachea in detail; but to point out a circumstance relative to its structure which I have not seen noticed in any book, although, having for some time back studied from Nature alone, I may be describing what

Fig. 1.

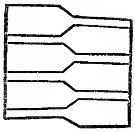


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

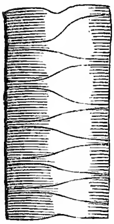


Fig. 6.

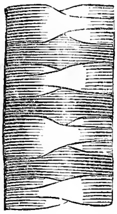


Fig. 7.

1

2

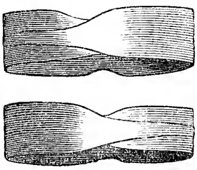
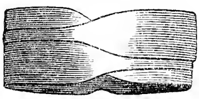


Fig. 8.

2

1



has been already observed by others. In CARUS's *Traité d' Anatomie Comparée*, it is stated that "not unfrequently, for example in the Heron and Swan, the left half and the right half of the rings of the trachea are alternately broader, which produces an appearance somewhat of this nature before and behind" (See Plate, fig. 1.). Mr. OWEN also says,—"they are generally of uniform breadth, but in some species are alternately narrower at certain parts of their circumference, and broader at others, and in these cases the rings are generally closely approximated together, and, as it were, locked into one another. This structure is most common in the *Grallatores*, where the rings are broadest alternately on the right and left sides: the French Academicians have given a good illustration of this structure from the trachea of the Demoiselle Crane." I mention these authors because they are the only ones at hand, and because I hold them in great estimation; but, nevertheless, I am obliged to assert that they and the "French Academicians" have been deceived. Not having examined the tracheas of all the birds in the world, I cannot, of course, say that such a structure does not exist; but I have not met with it in any bird hitherto examined by me, and am certain that it is not to be found in the Cranes, Herons, or Swans, as alleged. The real state of the matter is this:—

Owing to the frequent and extensive alternate contractions and elongations of the neck, the trachea requires to have a structure allowing it to undergo corresponding alterations, and this without any great change in its diameter. Solid rings connected by elastic membrane might, by the contraction of the latter, approximate so closely as greatly to diminish the length of the tube; but so great does this diminution occasionally require to be, that, to effect it in this manner, the rings would be too slender or too distant to maintain the calibre of the tube in a perfectly pervious state, and therefore a contrivance was necessary by which strength and a great degree of contraction, with a uniform diameter in all cases, might be combined; and this has been effected in the following manner.

Fig. 2 in the plate represents a portion of a windpipe in a state of relaxation; while Fig. 3 represents a portion in a state of contraction. In the former state, Fig. 2, the rings, which are equal, or nearly so, stand free, being separated by an intervening space occupied by elastic membrane. In the latter state, Fig. 3, the rings appear as if incomplete, or the trachea seems to be formed of alternate lateral half rings, presenting at their meeting in front and behind a zigzag line. In other cases, as in Fig. 4, the rings appear as if complete, but alternately broader on either side; in other words, each ring seems to have one lateral half broad, and the other half narrow. And it is thus that the rings of the trachea in many birds have been usually represented. But let us examine the matter

more closely; and, for this purpose, let us take the trachea of a large bird, a Wild Swan for example.

A portion of the trachea of that bird, one inch in length, when contracted to the utmost, Fig. 5, appears to be composed of alternating half rings; or, if less contracted, of entire rings alternately broad and narrow. But the same portion drawn out to its full extent, and then measuring two inches in length, Fig. 6, has a very different appearance, being evidently composed of equal rings, each however having a contraction, or two opposite notches, in the middle, in front, as well as behind. Now, if the rings be gradually brought together, we find that one overlaps the other in a peculiar manner, so as to produce the appearance represented by Fig. 5. Fig. 6 represents two rings, the membrane between which has been removed. The ring marked 1, is seen to be narrowed in the middle, and the portion of it to the right is plain or flat, while that to the left has a slight ridge running along its centre. The ring marked 2, is similar, but has the plain portion to the left, and that with the ridge placed to the right. In Fig. 7, these two rings are brought close together, when it is seen that N. 1 has overlapped N. 2 on the right side, as far as the right, while N. 2 has overlapped N. 1 on the left side to the same extent. N. 1 has thus passed within N. 2 on the left side, and over it to the right; and in this manner has been produced the appearance exhibited by Fig. 4. Without the contraction or double notch in each ring, this effect could, of course, not be produced, for it is there that the rings cross each other.

Thus, then, the trachea in its extreme state of contraction, when it is reduced one-half or one-third of its greatest length, undergoes but a very slight diminution in its diameter. The elastic membrane passes from the edge of one ring, over the next, to be inserted into the edge of the third. The intermediate ring thus slips in behind those on each side of it; while its other lateral half slips before those on each side. This mechanism I have observed in almost all the tracheæ which I have examined, although the rings vary much in breadth and thickness in different species.

In some birds the rings of the trachea are very narrow, and their intervals proportionally wide; and sometimes the rings are cartilaginous, or but partially ossified. All these circumstances are observed in the trachea of the Golden Eagle, the White-tailed Sea-eagle, the Peregrine Falcon, and the Grebes. Often, on the other hand, as in Cranes, Herons, Swans, and Mergansers, the rings are very broad, with very small intervals. As to the extensibility and contractility of the trachea, I may state that the windpipe of a Golden Eagle, when contracted to the utmost by the overlapping of its rings, measured $5\frac{1}{2}$ inches, but when extended to the utmost, $9\frac{1}{2}$ inches; that of a Curlew was 4 inches long when

contracted, and $6\frac{3}{4}$ inches when extended; and that of a Cormorant, in the former case $9\frac{3}{4}$ inches, and in the latter $15\frac{1}{4}$ inches. But as, in these cases, the bones of the upper larynx and lower larynx, which do not slip over each other, are included, a better idea of the extensibility of the trachea is obtained from a fragment of it taken from the middle. Thus, a portion of the trachea of a Rook, 1 inch long when contracted as much as it can be, measures $2\frac{3}{4}$ inches when extended to the utmost; and a portion of that of a Wood Pigeon 1 inch long when contracted, may be extended to $2\frac{1}{4}$ inches. But the greatest range known to me is exhibited by the dilated portion of the trachea of the Golden-eyed Duck, which may be contracted to a quarter of an inch, and extended to two inches and a quarter. This, however, is effected by a mechanism different from that usually exhibited; for although the rings cross each other in front, in the ordinary manner, they are narrower behind, and gradually fall within each other upwards.

Edinburgh, March 12, 1838.

THE LOWEST TEMPERATURE OF JANUARY, 1838.

By Hewett Cottrell Watson, Esq., F.L.S.
Editor of the *Phrenological Journal.*

According to the Meteorological Journal of the Royal Society, regularly published in *The Athenæum*, the minimum of the thermometer in January last was on the 16th, when the mercury fell very slightly below $11\frac{1}{2}$ degrees, the point to which it sunk on the 20th. Upon the faith of the Royal Society's Journal, the *Monthly Chronicle*, for March, has called in question the accuracy of the register at the Horticultural Gardens, Turnham Green, where the thermometer is said to have fallen 4 degrees below zero on the night following the 19th. Struck by the rapid sinking of the temperature, in the early part of that evening, I paid particular attention to my thermometers, and can bear testimony to the accuracy of the observations at the Horticultural Gardens, so far as a still lower temperature at a few miles distance can do this. At six o'clock on the evening of the 19th, a thermometer (made by Dollond), in a glass cylinder, fifteen feet above the ground, stood at 12 degrees. By eight o'clock the mercury had disappeared from the tube, which is graduated down to three degrees above zero. A short space intervening between the lowest line marked and the bulb, the mercury must have been at least down to zero at this time. I immediately suspended a common ivory thermometer (made by Adie) on a nail in the out-

side wall of my house, five feet above the ground. In one hour the mercury of this thermometer had disappeared from the tube, which is graduated to eight degrees below zero. Some observations which I was making on the rate of cooling within doors prevented me leaving this thermometer outside. Next morning at eight o'clock the mercury of DOLLOND's thermometer was just rising from the tube. I again put out ADIE's thermometer, which had fallen to two degrees above zero by nine o'clock, and it then commenced to rise again. From these observations, I am entitled to say, that in the country within fifteen miles of London, the cold *was* below zero of FAHRENHEIT, and probably continued so for at least twelve hours; and that the temperature of four degrees below zero was even exceeded in this parish of Thames Ditton. The circumstance of thermometers sold by our first makers of instruments of this kind, for the purpose of meteorological observation, not being graduated low enough to indicate the exact temperature of this night, is strongly indicative of the unusual severity of the cold. Indeed, from the facts stated, it is probable that on the night of the 19th of January, we had here a lower temperature than has been recorded in the vicinity of London. It may be fancied that the very low temperature is an indirect evidence of some inaccuracy in the observations, or in the graduation of the instruments. But in regard to the first supposition, I may add that the instruments were examined at intervals for some hours, so that there could be no mistake in reading the figures; and the agreement between the two instruments, made by different persons, both of whom are of high reputation, is presumptive proof of accuracy; beside which they have been compared with other thermometers by the same makers, and have been tried in various ways during several years in which they have been in my possession. A third themometer (a *minimum* register, by ADIE) also fell below zero, and became useless; but the index-pin was left at zero, the oil having adhered to the tube and separated. A farmer informed me that his thermometer fell to 14 degrees within doors. Hence we must conclude, either that London was many degrees warmer than the surrounding country on this night, or that the record at the Royal Society is inaccurately kept. Probably both circumstances occurred; at least no one can look over the tables published in *The Athenæum* without being convinced that the *minima* are incorrectly given; the temperature at a fixed hour being sometimes entered as *lower* than the *lowest* degree for the whole twenty-four hours of the same day.

In driving into town, on the morning after nights of frost in spring, I have frequently observed that the vegetation has suffered much more in this neighbourhood than has been the case nearer to London, which is presumptive proof of greater cold here; and our crops are always a few days later than those of Kent and Middlesex, in the parts near London. I will shortly send, for *The*

Naturalist, some notes on the effects of this extreme cold upon vegetation; at present it is impossible to ascertain the injury done to many species whose time of growth is not yet come. In my garden hundreds of evergreen shrubs appear to be destroyed, unless the main stems or roots may be still alive.

The paper in the *Monthly Chronicle*, which has called forth these remarks, is occupied with observations on Mr. MURPHY's predictions of the weather, which are so frequently altogether erroneous. The fixing the day of lowest temperature was certainly a very lucky guess, if a guess only; but there is an explanation which I have not seen referred to by his critics. Taking the average of a long series of years, the coldest weather of London occurs in the three days following the 18th of January. Hence the probability that the lowest temperature may occur on the night between the 19th and 20th. The day of actual greatest cold in single years is not uncommonly remote from the 20th of January; although in a series of years we shall find that it falls most frequently between the 13th and 23rd of January. According to HOWARD on the Climate of London, first edition, in the ten years following 1806, the lowest temperature occurred seven times in January; and six of these seven times were between the 13th and 23rd; the other being on the 29th. From this and other evidences I am disposed to think that Mr. MURPHY's prognostications are partly founded upon the empirical averages from past observations; that they are predictions *à posteriori*, and not really derived from principles which enable him to determine weather *à priori*. Most enthusiasts in science start from a few ascertained facts; and having imagined a theory in correspondence with these facts, they can never be wholly destitute of coincidences in favour of their imaginary principles.

The insertion of these remarks in *The Naturalist* will have two useful results; first, that of correcting an error published on influential authority; and secondly, it will show that prognostications of temperature may be made as *probabilities*, without thereby proving the prognosticator to have discovered any new and certain principles for calculating this beforehand.

Thames Ditton, Surrey,
March 4, 1838.

FURTHER HINTS TO YOUNG ENTOMOLOGISTS.

Observation.—Collection, and Arrangement of Specimens.

By Peter Rylands, Esq.

The essay of Mr. Lees on the "cob-web popularity" of Natural History (p. 115) deserves every attention, and I trust that it will excite a discussion on the question, which will in the end insure a *substantial* popularity for the science. Much, in the attainment of this object, may be effected by zoological and botanical Magazines. These ought not to be entirely devoted to abstruse, and to the student uninteresting, because unintelligible, articles. Papers ought to be inserted expressly for the benefit of those commencing the study of science. It is no argument against this to say that introductory works are plentiful, and easy to be procured. Many who would with pleasure peruse elementary articles in a periodical, would hesitate, or feel it a task, to read through a volume. And the fact is so obvious that it need not be dwelt upon, that he who learns with avidity and interest, will learn far better and far more than he who shrinks from the means which are used to instruct him. The student requires initiating by degrees, and this can be effected the best by short instructive articles in Magazines. I am pleased, therefore, that such are to be found in *The Naturalist*. To those which have already been inserted for the entomological student, the following will furnish a continuation.

On entering his career, the entomologist must seek information from three sources—books, observation, and the collection of specimens. The first of these has already been adverted to (p. 19), and I shall therefore pass to the consideration of the second.

No one has a claim to be considered as a *true* naturalist who is content with book-learning alone. Although much useful information may be gleaned by an assiduous perusal of publications, observation ought never to be neglected. Diligent reading will do much for the student—diligent observation will do more. Both are important—both necessary. The desire to investigate Nature should be stimulated as much as possible, as in it consist some of the most pleasant enjoyments of the naturalist. Huber selected as a motto to his work "*Cherchez, et vous trouverez*," and its truth, in this peculiar application, his admirable and highly interesting *Recherches sur les Fourmis*, fully manifests. This work constitutes a monument of indefatigable research, and persevering observation which will always insure its author a high place amongst genuine naturalists. Let all the readers of this paper choose the same motto, and exemplify it as Huber did, and the most important benefits both to themselves and the science would be the result. No fact should be taken for granted the in-

vestigation of which is within our reach—no statement, however high the authority from which it emanates, should be admitted without its being first verified by our own observation, if such verification is possible. The student has ample means for informing himself. Each walk in the country might be made a source of instruction. Every insect that wings its way past him, crawls at his feet, or buzzes near his person, should fix his attention and furnish material for thought. A system of diligent and persevering research should be cultivated. He will soon find the benefit of this course. His observation the more exercised, will be the more penetrating and the more accurate—his mind will be stored with facts—his information extensive and correct. He will be a naturalist in the *genuine* meaning of the term. And who that merits it may not be proud of the appellation?

Nor will the line of conduct just described be of benefit to the individual only. The science will also be benefited, and that not a little. The student deceives himself if he thinks that no new fact, no new illustration of the wonderful economy of Nature, can be discovered. In Entomology especially much remains to be accomplished. A wide untrodden field of discovery lies open for investigation. The habits of some even of our commonest insects are but little known, and of the rarer species scarcely any thing besides their colour and structure has been brought to light. Those insects which destroy the products of the labour of the agriculturist and horticulturist require still much attention, in order to determine their habits, &c.; and a remedy for the evil has yet to be suggested. These three important considerations—his own acquirement of information—the increase of human knowledge—and the welfare of the country at large—will, I trust, lead each of your readers to enter at once, and with zeal, on the only true method of studying Natural Science.

As an assistance in his studies, a collection of specimens is absolutely necessary to the entomologist. He will derive considerable advantage and pleasure from having them at hand for reference. Indeed, in order to become well acquainted with the structure, &c., of insects, and with the relation they bear to each other, he must often and carefully examine and re-examine them. This he will be enabled to do by having a cabinet well stored with preserved specimens. In the attainment of this important object, Mr. Dale's paper (p. 81) on the apparatus used by entomologists, will be found very useful. A few additional remarks on the time, place, and mode of collecting, may perhaps be deemed necessary.

During winter the entomologist can do little, although, perhaps, more than is generally believed. The bark of trees may be examined with advantage, as under and in it many species hybernate. The digger will be found useful in raising and separating the bark. *Dromii*, *Halticæ*, and a variety of other small

Coleoptera, often occur in this situation. Mr. SAMOUELLE remarks* that, at this season, "the entomologist should not omit to collect a quantity of Moss from the roots of trees, which may be carried home in a pocket-handkerchief, and examined by shaking it over a sheet of paper, upon which the insects will fall, and are easily discovered." *Carabacea*, *Staphylinacea*, &c., may thus be obtained; together with a goodly admixture of *Scolopendræ*, *Centipedes*, *Juli*, &c., which, not being now considered genuine insects, and having little interest attached to them, may be dispensed with by the entomologist. During winter also, digging at the roots of trees, for pupæ of *Lepidoptera*, may be recommended.

With the opening of spring commences the main business as well as pleasure of the naturalist. From April to August, a diligent "insect-hunter" will scarcely allow a day to pass without adding to his stores. During these months insects will be found plentifully in the following situations:—

Woods may always be frequented with advantage. The bark of trees must still be examined, as also the Moss at the roots. Many rare insects are obtained by beating the branches over a net—the larger for this purpose the better. *Hedges* may also be profitably beaten in the same manner. I have often obtained rare species by shaking branches which over-hung a ditch. The insects fall into the water, and may then be readily captured. In the evening hedges are much frequented by *Phalænacea*, &c. *Fields*, *Gardens*, &c., abound with insects. In these habitats the *Papilionacea* will be obtained. A great number of *Diptera*, *Hemiptera*, and *Coleoptera* may easily be captured by dragging a strong net over the long herbage. The roots of grass ought also to be well examined. Many valuable species may be found in flowers, &c. Nettles, Docks, and leaves of other indigenous plants, are always inhabited by quantities of *Curculiondiæ*, *Chrysomelidæ*, *Halticæ*, &c. &c. *Heaths*, *Commons*, *Sand-pits*, &c., are frequented by many species not found elsewhere. The same may be said of the *Banks of rivers*, *Margins of ponds*, and *Sea-shores*. On the latter the *rejectamenta* will find good employment for the entomologist. *Ponds* must be dragged for the *Dyticidæ*, &c., with the net described at page 82 (5). *Rushes*, and other *aquatic plants* are inhabited by the *Donaceæ*, &c., and therefore deserve attention. In the same habitats *Libellulacea* will be met with. *Decayed wood* furnishes food for numerous *Cerambycidæ*, *Staphylinacea*, &c.; these often penetrate to the depth of several inches, and must therefore be obtained by the digger. I have always considered *Church-yards* as excellent hunting-grounds for the entomologist. Hosts of insects may be captured in a few hours by removing the Moss, Grass-roots, &c., at the foot of the grave-stones. At the risk, therefore,

* *Entomologist's Useful Compendium*, p. 314 (1st. Edit.).

of being considered as a "*solitary*," *poet*, or "*body-snatcher*," the entomologist will do well to spend a portion of his time amongst the tombs. *Dead animals*, *dung of cattle*, *bones*, &c., are classed together in this summary, as some probably may feel little inclination to meddle with them. If such is the case, it will most assuredly be to their loss. The entomologist who conquers his disgust, will, by the examination of these substances, add many valuable captures to his collection.

During the autumnal months insects are far less plentiful. *Dyticidæ* may be obtained from the *ponds*, and a few *Hymenoptera* and *Phalænacea* may still be met with. The winter occupation described above must again be resorted to.

I cannot conclude this part of my subject without earnestly cautioning the student against suffering a passion for collecting to choke the desire of investigating Nature. From this results the misfortune which Mr. Swainson justly regrets, "that nearly all naturalists (?) *are more bent upon increasing the contents of their cabinets, than on studying the economy of those living objects which are perpetually crossing their path*."* If such a state of things continue, Natural History may well decline in Britain.

Were the student to place his insects in the cabinet without any order or classification, they would be of as little use to him as a dictionary in which words were mixed in utter confusion, would be to the scholar. It is necessary, therefore, that he proceed on some fixed and regular plan. The station which his specimens hold in the insect kingdom, and the names by which they are known in the scientific world, must be determined. He may obtain this knowledge, either by reference to plates, having the names supplied by a friend, or by carefully examining published descriptions. The first two methods are by far the easiest—and *the worst*. They cannot be too severely condemned. If they are used, that power of perception and just discrimination of differences, which is of the first importance to every naturalist, will never be obtained. Plates may be necessary sometimes, and the assistance of friends at the onset may be beneficial, but neither should be depended upon for the determination of species. Mr. Swainson has some excellent remarks on the acquisition and improvement of the habit of perception and discrimination. "Accuracy of observation," says he, "is one of the first qualifications which the student should acquire. A quick and discerning eye, accustomed by practice to distinguish differences which an ordinary observer would overlook, is absolutely essential. The most perfect acquaintance with all the systems that were ever invented, and with all the theories that have ever been promulgated, will never compensate for the want of this primary requisite....................This tact for observation, like every other habit, is to be acquired by practice; and the more it is exercised the more acute it becomes.

* *Treatise on the Geogr. and Classif. of Animals* (Lardn. *Cab. Cyc.*), p. 309.

The student would derive much advantage, in this respect, from placing before him ten or a dozen species of insects very closely resembling each other; such, for instance, as those composing the genus *Harpalus* [or *Amara*] (Beetles of easy acquisition, and which any entomological friend will point out to him), and then endeavouring to find out and define in writing, in what manner each species may be characterised. Occasional exercises of this sort will soon give him a keenness of perception, and a tact for discriminating, which he will be long in acquiring by other means."*

I have already recommended (p. 19) to beginners the use of the Linnæan system. It is necessary that, before proceeding further, the student should have a general knowledge of classification. For this purpose he may, at the onset, arrange his specimens under the Linnæan genera, paying no attention to the specific names. In order to do this, the characters of the Linnæan orders and genera must be well studied, and compared seriatim with the insects possessed. An acquaintance with some of the types of the most extensive divisions of modern systems will thus be obtained, and the study of them afterwards much facilitated. When he is tolerably acquainted with the outlines of the Linnæan, he may proceed to the modern arrangement. In this he will find much greater complexity. Before arriving at the species, orders, tribes, families, sub-families, genera, and in some instances sub-genera, must be passed through. However difficult the attainment of a knowledge of these numerous divisions may appear, it will be found in the end a very useful auxiliary. Let the student take any insect. By a comparison of its structure with the characters annexed to each of the orders, he will be able to determine to which it belongs. The tribes contained in the order selected, must next in like manner be proceeded with. Then the families in the tribes, and so on, until the descriptions of the species are arrived at. Lastly, the points in each description must be carefully compared with the specimen, and the species to which it belongs determined. At the commencement this course will be attended with considerable trouble; but each succeeding investigation will render the difficulty less. By assiduity and perseverance the student may obtain, in this manner, a perfect acquaintance with, and acute perception of, the structure, &c., of the insects that fall under his notice; together with a sound and extensive knowledge of classification, in all its ramifications.

The system which is adopted must of course be followed in arranging the specimens in the cabinet. "The modern practice, which is far the best," says Samouelle, "is to arrange insects in columns, with the generic name fastened by a pin above, and the specific below them ...... Males and females should be

* Ibid, pp. 305—307.

procured as far as possible...... Varieties should be procured, as they frequently tend to decide the species; mutilated specimens should [may] be rejected; but as we cannot always replace them by perfect ones, it is much better to retain them. There is a vile practice in use among collectors, to mend such specimens by parts from other insects. *I cannot sufficiently express my abhorrence of such ways*, but I should hope that no naturalist who is a lover of truth, and an admirer of Nature, will ever disgrace his cabinet by such paltry specimens, as they *can be of no use in a scientific view, and only serve to lead to errors*."*

In the characters of the genera, &c., and descriptions of the species, many technical terms occur, which are not a little puzzling to the student. Were these abolished, the attainment of a knowledge of the science would be greatly facilitated, but they are absolutely necessary. Mr. Swainson remarks, that "they constitute, in fact, the *language of Zoology*, since they are employed to express ideas which cannot be conveyed by words in ordinary use."† In order to enable the student to understand this "language," I purpose, with the Editor's permission, to give some "Further Hints" on *Orismology*, &c., in a future number.

Bewsey House, Warrington,
March 22, 1838.

ON THE GROWTH AND LONGEVITY OF TREES.

The instructive and generally-interesting character of the following article induces us to give it a place in *The Naturalist*. It appeared originally in the *Buckinghamshire Gazette*, and we feel happy in possessing the opportunity of giving it a more extensive circulation.

Trees may be considered under two heads:—first, those trees which, on account of the mode of their growth, cannot live beyond a certain period; a second, those whose mode of growth admits of a possibility of their existing an indefinite period.

The first mentioned class increase, when young, in diameter rather than in height, until a certain magnitude is attained, when they shoot up a stem, the diameter of which is never much altered. This is the mode of growth of the Palm tribe, and other intratropical plants; and it prevents them from attaining a great longevity. All the new woody matter produced by the leaves is insinuated down the centre of the stem. The effect of this is the displacing of the pre-existing

* Samouelle's *Entom. Useful Compend.* (1st Edit.), p. 322.
† *Treatise on the Geogr. and Class. of Animals*, p. 316.

woody matter, which is pressed out towards the circumference. By the continuance of this process, the stem becomes so compressed that it is not capable of any further compression. Thus there is no space left for the introduction of new woody matter from the leaves. The consequence is, that the full action of the functions of the leaves is prevented. The tree, therefore, perishes, because its vitality is dependent upon the full action of all its parts. Trees belonging to this class cannot exist beyond a definite period, which is seldom found to exceed 200 or 300 years.

The other class of trees increase principally in length, when young. They afterwards extend in diameter by means of longitudinal fibres being insinuated by the leaves under the bark, on the outside of the wood. The bark being capable of indefinite extension, it is evident that nothing independent of accident can put an end to the existence of such trees. Eminent botanists see nothing unplausible, and no one can point out anything impossible, in the idea that some trees of this kind at present existing may have been spectators of the flood.

The age of trees belonging to this class can be ascertained by counting the number of rings into which they are divided. Every one of these rings must have been produced in neither more nor less than a year; and this is the ground upon which botanists have arrived at such precise conclusions concerning the longevity of some trees. We shall notice the ages of a few ascertained in this manner.

Decandolle mentions an Elm 335 years old; a Cypress, about 350; a *Cheirostemon*, about 400; an Ivy, 450; a Larch, 576; an Orange-tree, 530; an Olive-tree, 700; an oriental Plane, 720; a Cedar of Lebanon, about 800; Oaks, 870, 1,080, and 1,500; Limes, 1,076, and 1,147; Yews, 1,214, 1458, 2,280, and 2,588!

At Ellerslie, the birth place of Wallace, near Paisley, there is an Oak-tree which is said to have concealed under its branches Wallace and 300 of his followers. However doubtful this may be, it is certain that "the Wallace Oak" cannot be much less than 700 years old.

Eight Olive-trees still grow in the garden at Gethsemane, near Jerusalem, which can be proved to have been there more than 800 years ago, and which are alleged to have been witnesses of the Saviour's agony.

Such great antiquity, however, is small when compared to the age of the Baobab, some specimens of which, growing in Africa, Adanson found to be 5,000 years old! Even this great age is surpassed by that assigned to the *Taxodium* by Decandolle, who makes some specimens which he discovered in South America to be 5,840 years old! Adanson ascertained some Banian trees to be of equal antiquity.

LIST OF FLOWERING PLANTS FOR EVERY MONTH IN THE YEAR.

May.

(Continued from page 195.)

Common Maple, *Acer campestre ;* Greater Maple, *A. pseudo-platanus ;* Herb Christopher, *Actæa spicata ;* True Maidenhair, *Adiantum capillus-veneris* ; Corn Pheasant's-eye, or Adonis-flower, *Adonis autumnalis* ; Tuberous Moschatell, *Adoxa moschatellina* ; Smooth Alpine Hairgrass, *Aira Alpina ;* Water Hairgrass, *A. aquatica ;* Early H., *A. præcox ;* Yellow Bugle, or Ground-pine, *Ajuga chamæpitys ;* Pyramidal B., *A. pyramidalis* ; Common B., *A. reptans ;* Field Ladies'-mantle, *Alchemilla arvensis ;* Broad-leaved Garlic, *Allium ursinum ;* Meadow Fox Tailgrass, *Alopecurus pratensis ;* Evergreen Alkanet, *Anchusa sempervirens ;* Pasque-flower Anemone, *Anemone pulsatilla ;* Sweet-scented Vernal-grass, *Anthoxanthum odoratum ;* Common Beaked Parsley, *Anthriscus vulgaris ;* Ivy-leaved Snapdragon, *Antirrhinum cymbalaria ;* Hairy Wall-cress, *Arabis hirsuta ;* Bristol W., *A. stricta ;* Tower W., *A. turrita ;* Black Bear-berry, *Arbutus Alpina ;* Plantain-leaved Sandwort, *Arenaria trinervis ;* Vernal S., *A. verna ;* Common Cuckoo-pint, *Arum maculatum ;* Common Asarabacca, *Asarum Europæum ;* German Madwort, *Asperugo procumbens ;* Sweet Woodruff, *Asperula odorata ;* Rough Alpine Shield-fern, *Aspidium lonchitis ;* Common Maidenhair Spleenwort, *Barbarea præcox ;* Early Winter-cress, *B. vulgaris ;* Common Daisy, *Bellis perennis ;* Common Barberry, *Berberis vulgaris ;* Common Birch, *Betula alba ;* Dwarf B., *B. nana ;* Rape-seed, *Brassica napus ;* Sea Cabbage, *B. oleracea ;* C. Quaking-grass*, *Briza media ;* Red-berried Bryony, *Bryonia dioica ;* C. Earth-nut, *Bunium flexuosum ;* Vernal Water-starwort, *Callitriche verna ;* C. Marsh-marigold, *Caltha palustris ;* Bitter Ladies'-smock, *Cardamine amara* ; Hairy L., *C. hirsuta ;* Impatient L., *C. impatiens ;* Meadow L., *C. pratensis ;* Slender Spike Sedge, *Carex acuta ;* Slender Beaked Bottle S., *C. ampullacea ;* Axillary Clustered S., *C. axillaris ;* Dwarf Silvery S., *C. clandestina ;* Tufted Bog S., *C. cæspitosa* ; Prickly Separate-headed S., *C. Davalliana ;* Starved Wood S., *C. depauperata ;* Fingered S., *C. digitata* ; Creeping Separate-headed S., *C. dioica ;* Bracteated Marsh S., *C. divisa ;* Grey S., *C. divulsa ;* Yellow S., *C. flava* ; Hairy S., *C. hirta ;* Soft Brown S., *C. intermedea ;* Smooth-stalked Beaked S., *C. lævigata ;* Greater Prickly S., *C. muricata* ; Pale S., *C. pallescens* ; Lesser C. S., *C. paludosa* ; Pink-leaved S., *C. panicea* ; Great Pendulous S., *C. pendula ;* Round-headed S., *C. pilulifera ;* Glaucous Heath S., *C. recurva ;* Re-

* C. stands for Common.—Ed.

mote S., *C. remota*; Great C. S., *C. riparia*; Little Prickly S., *C. stellulata*; Loose Pendulous S., *C. strigosa*; Pendulous Wood S., *C. sylvatica*; Lesser Panicled S., *C. teretiuscula*; Short Spiked Bladder S., *C. vesicaria*; Great Compound Prickly S., *C. vulpina*; C. Hornbeam, *Carpinus betulus*; Field Chickweed, *Cerastium arvense*; Little Mouse-ear Ch., *C. semidecandrum*; Four-cleft Ch., *C. tentrandrum*; Narrow-leaved Ch., *C. viscosum*; Broad-leaved Ch., *C. vulgatum*; Wild Wall-flower, *Cheiranthus fruticulosus*; C. Celandine, *Chelidonium majus*; Mercury Goosefoot, *Chenopodium Bonus-Henricus*; Wild Chervil or Cow-parsley, *Chærophyllum sylvestre*; Alternate-leaved Golden Saxifrage, *Chrysosplenium alternifolium*; Opposite-leaved G., *Ch. oppositifolium*; Mountain Fleawort, *Cineraria integrifolia*; Hoary Dwarf Cistus, *Cistus marifolius*; English Scurvy-grass, *Cochlearia Anglica*; Horse-radish, *C. armoracia*; Danish Scurvy-grass, *C. officinalis*; Lily-of-the-valley, *Convallaria majalis*; C. Solomon's-seal, *C. multiflora*; Angular S., *C. polygonatum*; C. S., *Corallorrhiza innata*; Sea Kale, *Crambe maritima*; Bulbiferous Coral-wort, *Dentaria bulbifera*; Great Leopard's-bane, *Doronicum pardalianches*; Simple-haired Whitlow-grass, *Draba hirta*; Hoary Wh., *D. incana*; Speedwell-leaved Wh., *D. muralis*; Black Crow-berry, *Empetrum nigrum*; Alpine Barrenwort, *Epimedium Alpinum*; Branched Wood Horse-tail, *Equisetum sylvaticum*; Alpine Cotton-grass, *Eriophorum Alpinum*; Downy-stalked C., *E. pubescens*; Sea Stork's-bill, *Erodium maritimum*; Garlic Treacle-mustard, *Erysimum alliaria*; C. Spindle, *Euonymus Europæus*; Cypress Spurge, *Euphorbia cyparissias*; Caper S., *E. lathyris*: Sweet Chesnut, *Fagus castanea*; C. Beech, *F. sylvatica*; C. Corn-salad, *Fedia olitoria*; Wood Strawberry, *Fragaria vesca*; C. Ash, *Fraxinus excelsior*; Simple leaved A., *F. heterophylla*; Yellow Fumitory, *Fumaria lutea*; C. F., *F. officinalis*; Solid Bulbous F., *F. solida*; Yellow Weasel-snout, *Galeobdolon luteum*; Goose-grass Bedstraw, *Galium aparine*; Crosswort B., *G. cruciatum*; Needle Greenweed, *Genista Anglica*; Hairy G., *G. pilosa*; Dwarf Gentian, *Gentiana acaulis*; Jagged-leaved Crane's-bill, *Geranium dissectum*; C. Dove's-foot C., *G. lucidum*; Shining C., *G. molle*; Knotty C., *G. nodosum*; Dusky C., *G. phæum*; Stinking C., *G. Robertianum*; C. Avens, *Geum urbanum*; Violet Horned-poppy, *Glaucium violaceum*; C. Ground-ivy, *Glechoma hederacea*; C. Dame's-violet, *Hesperis matronalis*; C. Mouse-ear Hawkweed, *Hieracium pilosella*; Northern Holy-grass, *Hierochloe borealis*; Tufted Horse-shoe-vetch, *Hippocrepis comosa*; C. Sallow-thorn, *Hippophae rhamnoides*; C. Mare's-tail, *Hippuris vulgaris*; Starch Hyacinth, *Hyacinthus racemosus*; Marsh Pennywort, *Hydrocotyle vulgaris*; Tunbridge Filmy-fern, *Hymenophyllum Tunbridgense*; C. Holly, *Ilex aquifolium*; European Squill-wort, *Isaetes lacustris*; Dense-headed Rush, *Juncus capitatus*; C. Juniper, *Juniperus communis*; Dwarf Alpine J., *J. nana*; White Dead-nettle, *Lamium album*; Henbit D., *L. amplexicaule*; Cut-leaved D., *L.*

incisum; Red D., *L. purpureum*; Crimson Vetchling, *Lathyrus nissolia*; C. Dandelion, *Leontodon taraxacum*; Summer Snowflake, *Leucojum æstivum*; C. Privet, *Ligustrum vulgare*; Two-flowered Linnæa, *L. Borealis*; Bird's-nest Listera, *Listera nidus-avis*; Corn Gromwell, *Lithospermum arvense*; C. Gromwell, *L. officinale*; Creeping Gromwell, *L. purpuro-cæruleum*; Perfoliate Honeysuckle, *Lonicera caprifolium*; Slender Bird's-foot Trefoil, *Lotus angustissimus*; Field Wood-rush, *Luzula campestris*; Narrow-leaved Hairy W., *L. Forsteri*; Great W., *L. sylvatica*; Red or White Campion, *Lychnis dioica*; Catchfly C., *L. viscaria*; Yellow Pimpernel, *Lysimachia nemorum*; C. Mallow, *Malva sylvestris*; Wild Camomile, *Matricaria chamomilla*; Shrubby Stock, *Matthiola incana*; Black Nonesuch, *Medicago lupulina*; Spotted N., *M. maculata*; Wood Medick, *Melica uniflora*; Purple-and-white Bastard-balm, *Melittis grandiflora*; Reddish B., *M. melissophyllum*; Perennial Mercury, *Mercurialis perennis*; C. Medlar, *Mespilus Germanica*; White-thorn or Haw-thorn, *M. oxyacantha*; Spignel, *Meum athamanticum*; Upright Mœnchia, *Mœnchia erecta*; Water Blinks, *Montia fontana*; Tufted Water Scorpion-grass, *Myosotis cæspitosa*; Trailing S., *M. intermedia*; Yellow-and-blue S., *M. versicolor*; C. Mouse-tail, *Myosurus minimus*; Dutch Myrtle, *Myrica gale*; Sweet Cicely, *Myrrhis odorata*; Pale Narcissus, *Narcissus biflorus*; Poetic N., *N. poeticus*; C. Goutweed, *Ægopodium podagraria*; C. Adder's-tongue, *Ophioglossum vulgatum*; Drone Orchis, *Ophrys fucifera*; Great Brown-winged O., *Orchis fusca*; Marsh Palmate O., *O. latifolia*; Early Purple O., *O. mascula*; Military O., *O. militaris*; Green-winged O., *O. morio*; Monkey O., *O. tephrosanthos*; Drooping Star-of-Bethlehem, *Ornithogalum nutans*; C. S., *O. umbellatum*; C. Bird's-foot, *Ornithopus perpusillus*; Wood Bitter-vetch, *Orobus sylvaticus*; C. B., *O. tuberosus*; C. Wood-sorrel, *Oxalis acetosella*; Yellow Procumbent W., *O. corniculata*; Herb Paris, *Paris quadrifolia*; Dwarf Burnet Saxifrage, *Pimpinella dioica*; Large-flowered Butterwort, *Pinguicula grandiflora*; C. Butterwort, *P. vulgaris*; Scotch Fir, *Pinus sylvestris*; Buck's-horn Plantain, *Plantago coronopus*; Greater P., *P. major*; Hoary P., *P. media*; Annual Meadow-grass, *Poa annua*; Bulbous M., *P. bulbosa*; Smooth-stalked M., *P. pratensis*; Entire-leaved Piony, *Pæonia corallina*; Four-leaved All-seed, *Polycarpon tetraphyllum*; C. Knot-grass, *Polygonum aviculare*; C. Polypody, *Polypodium vulgare*; Three-tooth Cinque-foil, *Potentilla tridentata*; Spring C., *P. verna*; C. Cowslip, *Primula veris*; Wild Cherry, *Prunus cerasus*; Bird Cherry, *P. padus*; Narrow-leaved Lungwort, *Pulmonaria angustifolia*; C. L., *P. officinalis*; Mountain-ash, *Pyrus aucuparia*; White Pear, *P. aria*; Iron Pear, *P. communis*; True Service, *P. domestica*; Wild Apple, *P. malus*; Bastard Mountain-ash, *P. pinnatifida*; Wild Service, *P. torminalis*; Sessile-fruited Oak, *Quercus sessiliflora*; Alpine Crowfoot, *Ranunculus Alpestris*; White Floating C., *R. aquatilis*; Wood C., *R. auricomus*;

Bulbous C., *R. bulbosus;* Grassy C., *R. gramineus;* Ivy C., *R. hederaceus;* Small-flowered C., *R. parviflorus;* C. Buckthorn, *Rhamnus catharticus;* Alder B., *Rh. frangula;* Mountain Rose-root, *Rhodiola rosea;* Tasteless Mountain Currant, *Ribes Alpinum;* Black Currant, *R. nigrum;* Rock C., *R. petræum;* C. C., *R. rubrum;* Acid Mountain C., *R. spicatum;* Cinnamon Rose, *Rosa cinnamomea;* Dwarf Crimson Bramble, *Rubus Arcticus;* Raspberry, *R. idæus;* Small-flowered Pearlwort, *Sagina apetala;* Sea P., *S. maritima;* Procumbent P., *S. procumbens;* C. White Willow, *Salix alba;* Broad-leaved Triandrous W., *S. amygdalina;* Downy Mountain W., *S. arenaria;* Silky Sand W., *S. argentea;* Green Mountain W., *S. Andersoniana;* Round-eared W., *S. aurita;* Shining Dark-green W., *S. bicolor;* Dark Upright W., *S. Borreriana;* Broad-leaved Monadelphous W., *S. Croweana;* Davallian W., *S. Davalliana;* Varnished W., *S. decipiens;* Rusty-branched W., *S. Doniana;* Fishy W., *S. fœtida;* Glaucous Mountain W., *S. Forsteriana;* Crack W., *S. fragilis;* Brownish Dwarf W., *S. fusca;* Glaucous Mountain W., *S. glauca;* Hairy-branched W., *S. hirta;* Short-leaved Triandrous W., *S. Hoffmanniana;* Trailing Silky W., *S. incubacea;* Sharp-leaved Triandrous W., *S. lanceolata;* Green Whortle-leaved W., *S. myrsinites;* Tea-leaved W., *S. phylicifolia;* Plum-leaved W., *S. prunifolia;* C. Dwarf W., *S. repens;* Green-leaved W., *S. rubra;* Silky Rock W., *S. rupestris;* Bedford W., *S. Russelliana;* Silky-leaved W., *S. Smithiana;* Thin-leaved W., *S. tenuifolia;* Four-ranked W., *S. tetrapla;* Long-leaved Triandrous W., *S. triandra;* Veiny-leaved W., *S. venulosa;* C. Willow, *S. viminalis;* Yellow W., *S. vitellina;* Wulferian W., *S. Wulferiana;* Wood Sanicle, *Sanicula Europæa;* Involute Alpine Saxifrage, *Saxifraga affinis;* White Meadow S., *S. granulata;* Mossy S., *S. hypnoides;* Mossy Alpine S., *S. muscoides;* Web-footed-leaved S., *S. pedatifida;* Rue-leaved S., *S. tridactylites;* Harebell Squill, *Scilla nutans;* Scaly Hart's-tongue, *Scolopendrium ceterach;* Yellow Figwort, *Scrophularia vernalis;* C. Groundsel, *Senecio vulgaris;* Blue Sherardia, *Sherardia arvensis;* Wild Charlock, *Sinapis arvensis;* Least Water-parsnep, *Sium inundatum;* C. Alexanders, *Smyrnium olustarum;* C. Broom, *Spartium scoparium;* Lesser Stitchwort, *Stellaria graminea;* Greater S., *S. holostea;* C. S., *S. media;* Wood S., *S. nemorum;* C. Comfrey, *Symphytum officinale;* Naked-stalked Teesdalia, *Teesdalia nudicaulis;* C. Shepherd's-purse, *Thlaspi bursa-pastoris;* Perfoliate S., *Th. perfoliatum;* Mossy Tillæa, *Tillæa muscosa;* Knotted Hedge-parsley, *Torilis nodosa;* Purple Goat's-beard, *Tragopogon porrifolius;* Short-styled Bristle-fern, *Trichomanes brevisetum;* European Wintergear, *Trientalis Europæa;* Honeysuckle Trefoil, *Trifolium pratense;* White T., *T. repens;* Rough T., *T. scabrum;* Subterraneous T., *T. subterraneum;* Sea Arrowgrass, *Triglochin maritimum;* Mountain Globe-flower, *Trollius Europæus;* Black Bilberry, *Vaccinium myrtillus;* Great B., *V. uliginosum;* Procumbent Field Speedwell,

Veronica agrestis; Wall S., *V. arvensis*; Germander S., *V. chamædrys*; Ivy-leaved S., *V. hederifolia*; Mountain S., *V. montana*; C. S., *V. officinale*; Smooth S., *V. serpyllifolia*; Mealy Guelder-rose, or Way-fairing-Tree, *Viburnum lantana*; Spring Vetch, *Vicia lathyroides*; C. V., *V. sativa*; C. Bush V., *V. sepium*; Greater Periwinkle, *Vinca major*; Lesser P., *V. minor*; Dog's Violet, *Viola canina*; Dwarf Yellow V., *V. flavicornis*; Cream-coloured V., *V. lactea*; Yellow Mountain Violet, *V. lutea*; Pansy V., *V. tricolor*; C. White Misseltoe, *Viscum album*.

CORRESPONDENCE.

The British Swans.

To the Editor of the Naturalist.

Honored Sir,—I was glad to see (p. 213) that you had drawn the attention of your readers to the probability of the occurrence of Bewick's Swan during the recent extremely severe winter—a circumstance which I beg to impress still further. I have not myself met with any species but the Hooper Swan (*Cygnus ferus*); but from the various paragraphs which I have noticed in the newspapers, as well as from the information received from friends, I consider it all but certain that specimens of Bewick's Swan have been shot, both in England and Scotland, during the last few months. If any of your readers would come forward and state what they know on the subject, through the pages of *The Naturalist*, I should feel obliged to them. I am inclined to think that Bewick's Swan will eventually prove to be a more frequent visitor to our shores than is at present recorded by ornithologists; but of course I offer no positive opinion on the subject, wishing merely to draw the attention of abler naturalists than myself to the question.

I am, Hon. Sir,
Your most obedient servant,
G. L. Lister,
Game-dealer, &c.

Edinburgh, April 1, 1838.

CHAPTER OF CRITICISM.

The Organ of Locality, and the Migration of Birds.

To the Editor of the Naturalist.

Bewsey House, March 2, 1838.

My dear Sir,—In the note at p. 129, annexed to my paper on the "Migration of Birds," you have evidently mistaken my meaning. I do not mean, nor did I state, that in the first instance the organ of Locality was absent in migratory birds. I fully agree with you in the opinion that "birds were *originally*, and still are, impelled to migrate by the innate faculty of Locality," and that "the feeling of hunger or of cold would only impel the animal to seek food, and would not teach it that by crossing the seas sustenance could be obtained." My argument was merely to prove that, primarily, coldness of climate and want of nourishment were the only causes of the *periodical excitement* of the organ—not that they originated the organ itself. It was not the propensity, but the *excitement* of it, at *stated periods*, which was the object of discussion. A reference to the paper will, I think, make this evident. If it does not, the fault is mine, for not having expressed my sentiments more clearly. I am obliged to you for having called my attention to it, as this explanation will prevent others committing the same mistake.

Yours very truly,

Neville Wood, Esq., &c. Peter Rylands.

[Our criticism referred chiefly to our correspondent's opinion (p. 129) that, "at first, the coldness of climate, and want of nourishment, were the *only causes of migration*." This is the opinion of many naturalists, but Phrenology satisfactorily demonstrates its utter impossibility. Taken separately, the passage we have quoted justified our note; but, in conjunction with the rest of the paragraph, Mr. Rylands's meaning is probably sufficiently obvious. We are glad to find that there is actually no difference of opinion between Mr. R. and ourselves, and beg to thank him for his kindness in pointing out our misapprehension of the passage alluded to.—Ed.]

Strictures on the Wood-cuts in Yarrell's "British Birds."

To the Editor of the Naturalist.

Dear Sir,—You have in *The Naturalist* (Vol. II., pp. 281, 379; Vol. III., pp. 57, 165, 225) reviewed the parts of Mr. Yarrell's *British Birds* as they have appeared; and as I do not think that you have sufficiently deprecated the falling-

off in the wood-cuts subsequent to the first, I wish to address a few remarks for the consideration of your readers. In reviewing the third part, at p. 57, you certainly hint at something of the kind, and "trust that this falling-off is only temporary, and that subsequent publications will not tend to justify the doubtless erroneous suspicion—which has already reached our ears—that so much pains were taken with the wood-cuts in the first part merely to ensure a large sale for the work." If your readers will take the trouble critically to examine parts iii., iv., and v., I fear this suspicion will be too strongly confirmed by the inferiority of some of the wood-cuts, and unless subsequent numbers improve, it will greatly deteriorate the sale of the work. Those illustrations which your readers will doubtless on close inspection find to be extremely faulty, are the following:—the Montagu Harrier, p. 100; Red-backed Shrike, p. 154; Spotted Flycatcher, p. 164 (Is this the Grey Flycatcher, which you mention as exceptionable at p. 165 of *The Naturalist?**); Fieldfare, p. 189; Golden Oriole, p. 212; Hedge Accentor, p. 223; Redstart, p. 237 (very bad).

Perhaps the wood-cut which is the freest from that stiffness which unfortunately pervades them is the Blackbird, p. 202; to coin a phrase, it is the most *Bewickian*. There are many other birds in which anything but excellence is visible, but I only wish to draw the attention of your readers to the most faulty, as it would ill become one who is merely a student in the paths of Nature to be too critical. That Mr. YARRELL's wood-cuts are much inferior to those of BEWICK in the position and natural character of the birds, I have heard more than one ornithologist confess; in point of engraving, the advantage is certainly with Mr. YARRELL; but which is of the most consequence to the ornithologist I will leave to your readers to determine. The public may be dazzled and led away by the superior style and finish of the engravings, but the lover of Natural History should never lose sight of what is certainly of infinitely more conseqence to him—a correct representation of the object. Many of Mr. YARRELL's birds are apparently drawn from badly stuffed specimens, which is indicated by the stiffness of those that I have pointed out. Those of your readers who wish to be informed on the present state of wood-engraving (which is not so palmy as the public imagine), will find much interesting and valuable information in the second and third chapters of the second volume of HOWITT's *Rural Life in England*, a work invaluable to all lovers of the country. If you think these remarks worth inserting in *The Naturalist*, I may on a future occasion say a word or two on Mr. BELL's *Quadrupeds*.

I am, Dear Sir, &c. &c. &c.,

Woodside, March 1, 1838. T. B. HALL.

* It is the same.—ED.

[We agree with some of Mr. HALL's observations, and should be glad to notice an improvement in several of the illustrations; but every ornithologist extensively acquainted with illustrated publications on Natural History, is fully aware of the small proportion of first-rate engravings which they commonly contain, and that in works of an inferior grade tolerable cuts are quite the exception. With these facts in view, and gratified with the admirable character of the letter-press, we could not but speak highly of so spirited an undertaking as that under consideration, but at the same time considered it requisite to give a *hint* with regard to the character of the wood-cuts, as a suggestion for future improvement. We consider the engravings in Mr. YARRELL's numbers, on the whole, superior to those of most works of a similar character, whether containing wood-cuts or coloured plates. To BEWICK's they at least bear a very fair comparison, the rough style of that artist's work in many cases alone sufficing to carry off the otherwise obvious defects of position, &c. Thus while the modern finished style of wood-cutting takes in the public in general, BEWICK's off-hand and frequently coarse workmanship—in addition to the partiality naturally felt for an old favourite—tends, we doubt not, in many instances to veil similar defects from more critical observers. Many of BEWICK's *figures* (*i. e.* as regards outline, &c.) would at once be unmasked if finished by an artist of our own day.—The modern wood-cutters are, beyond all question, advanced far beyond BEWICK in their art; but in the case of works on Natural History they either copy bad drawings or specimens, or else lack all knowledge of and taste for Natural Science; and in neither case are the artists to blame. Who that is acquainted with the birds in their native haunts, and after inspecting the engravings on India-paper in the second volume of *The Naturalist*, will venture to affirm that we possess no ornithological artist to be compared to BEWICK? The engraver ought not merely to be eminent as a wood-cutter, but as an engraver of birds, should copy from good specimens or drawings, and be superintended by a competent artist. The parties concerned in the publication of the work which has given rise to these observations, know all this as well as we do, but then comes the question, would the sale of the book remunerate for so much trouble and expense? We believe that it would not, and that the majority of the public are perfectly satisfied with the engravings as they at present get them. Why, then, need the publisher put himself to an expense which will prove a loss to him, merely to please a few ornithologists? The reply is obvious: he need not, and therefore will not, saddle any such trouble or expense upon himself. Mr. HALL, however, believes that the deterioration will greatly diminish the sale of the work. All we can say is, *we wish it would*, and should hail with pleasure so powerful a demonstration of the progress of Natural History in Britain. Our correspondent wrote with the view of exposing the character of the wood-cuts in Mr. YARRELL's work, and

possibly he may complain of our having pointed out the ignorance of the public as regards matters of this nature, and, by thus "letting the Cat out of the bag," of having defeated the result which his epistle might otherwise have had, of improving the illustrations. But we beg to observe that in this, as in every other matter, we desire alone to sift and obtain, if possible, the TRUTH—before which all other considerations ought to shrink into insignificance.—ED.]

THE VERNACULAR NAMES OF *Totanus ochropus* AND *T. glottis*.

To the Editor of the Naturalist.

MY DEAR SIR,—There appears to be some confusion in the vernacular names of *Totanus ochropus* and *T. glottis*, as given in *The Naturalist*. At p. 73, Vol. II., Mr. MORRIS denominates the former "*Greenshank*," and the latter species "*Green Sandpiper*." Mr. DALE (II., 179) has, on the contrary, *T. ochropus* "*Green Sandpiper*." The vernacular name given to *T. glottis* in my "Catalogue" (II., 354) is "*Greenshank*," which you have again applied to *T. ochropus*. I should like this confusion avoided. The authority of naturalists favours the nomenclature adopted by Mr. DALE and myself. MONTAGU, BEWICK, SELBY, JENYNS, &c., unite in denominating *T. glottis* the Greenshank, and *T. ochropus* the Green Sandpiper. As the plumage of the former is *not* green, it has no right to that appellation; but, its feet being of that colour, it may appropriately be termed the Greenshank. And yet some would claim this name for *T. ochropus*, because of the derivation of its specific appellation, from ωχρος (yellowish-green) and πους (foot). This difficulty may be removed by considering *ochropus* as derived from ωχρος and ωψ (aspect). This will give us *T. ochropus*, Green Sandpiper, and *T. glottis*, Greenshank Sandpiper, which is in my opinion the correct nomenclature. Perhaps the above may be considered "much ado about nothing," but I doubt not, Mr. EDITOR, your love for precise nomenclature will lead you to think otherwise. Believe me,

Very faithfully yours,

PETER RYLANDS.

Bewsey House, March 2, 1838.

[Our correspondent will find, on reference, that SELBY names both *T. ochropus* and *T. glottis* "Greenshank," and certainly the appellation would in some measure suit both. But we believe the plan proposed above to be the best.—ED.]

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

HULL LITERARY AND PHILOSOPHICAL SOCIETY.

At the meeting of this society on March 6, Mr. Adams, of London, read a paper on an apparatus for solidifying carbonic acid, which he illustrated by a number of drawings. In the course of the lecture he gave an account of the various experiments which he had made both to liquify and to solidify carbonic acid.—W. H. Dikes, Esq., read a very interesting paper written by a gentleman now deceased, on the subject of the "Geography of Botany," or the consideration of plants with reference to climate, and the endeavour to refer the phenomena of their growth and distribution to external causes. After slightly sketching the history of the science, Mr. Dikes proceeded to give an account of its present state, and to demonstrate some of those points which make its details valuable. With this view he first noticed the influence which the elements of heat, light, moisture, soil, and atmosphere, produced on plants; and then proceeded to illustrate the laws of climate which he had laid down, by tracing, in a cursory manner, the progress of vegetation from the Poles to the Equator. The paper concluded by a number of interesting observations on the causes which have contributed to produce the distribution of plants.—A vote of thanks was given to Mr. Dikes for his valuable communication.—*Hull Packet*, *March* 9, 1838.

UNION OF THE CHELTENHAM HORTICULTURAL AND FLORAL SOCIETY, AND THE GLOUCESTERSHIRE ZOOLOGICAL, BOTANICAL, AND HORTICULTURAL SOCIETY.

The Cheltenham Horticultural and Floral Society has become one with the Gloucestershire Zoological, Botanical, and Horticultural Society. This union was completed at an adjourned meeting of the members of the former Society, which took place on Tuesday, January 30th, at which meeting the report of the Committee appointed at the annual general meeting, in December, to consider the proposition made by the Secretary of the Zoological Society for that porpose, was received and adopted. From this report, and the recommendations and provisions which it contained, it was evident that the Committee had bestowed considerable attention upon the subject in all its details, and had, after mature deliberation, come to the conclusion that the objects of the Floral Society would henceforth be best promoted and secured by its becoming identified with the Zoological Society. The privileges of the present members of the former Society are to be strictly preserved to them, and they are in addition to enjoy the advantage of admission to the gardens of the latter on the days of floral exhibitions. These will take

place on the same plan as heretofore, the first, for the show of spring flowers, being held in April, and the second on the 24th of May, the day upon which it is purposed to open the Gardens. The arrangements for these exhibitions, under the auspices and direction of the Zoological and Botanical Society, are expected soon to be completed, and we doubt not they will prove such as will ensure increased eclât for all the flower-shows of future years.—*Cheltenham Looker-On, Feb.* 10, 1838.

CHELTENHAM LITERARY AND PHILOSOPHICAL INSTITUTION.

The following reports are extracted from various numbers of the *Cheltenham Looker-On.*

The weekly meetings of this Institution were resumed on January 30, when Dr. Theodore Boisragon delivered a lecture on Meteorology before a numerous and highly respectable audience, consisting of the members of the Society and their friends. The learned gentleman commenced his discourse by an elaborate introduction, in which the objects proposed by Literary and Philosophical Institutions were described to be "the bringing before the public subjects in science and arts generally, so as to lead the mind to recognize, through all the media of science, those principles pervading and connecting phenomena very little related to each other, yet constituting the chain which links all Nature." In exemplification of this, Meteorology was referred to, and its principles briefly stated. The precise import of the terms *principle*, *philosophy*, and *wisdom* was inquired into, and illustrated by reference to the relations subsisting between the facts incident to the various phenomena of Meteorology; the effects produced by heat on confined air being selected as an example. The nature of a philosophical truth was explained in its connection with the Fine Arts, Science, Morals, and Religion; adverting to its connection with the last, the lecturer remarked :—

"Even religion itself, and of course the adoption of the best form of it, may according to this view be said to be a proof of sound philosophy in the person embracing it, when founded according to the truth of the relations on which its evidence is based; and that form of it of course which, in its adaptation both to the infirm nature of the dependant, though immortal, being for whom it was designed; and the glorious object it was intended to fulfil, is the truest, and thus the most philosophical. In short, examples in philosophy are almost innumerable in every relation of life;—in fact, wherever the term relation can be admitted, and we have to frame our conduct *by reason*, we may be said to be philosophically engaged. But true philosophical training of the mind has also this one great advantage. It is the part of a true philosopher to see how finite the human mind shows itself in relation to the wonderful mysteries of creation, and this reflection has a most beneficial influence upon his judgment in cases where

he has to form an opinion on points which are not demonstrable; for, although he does not take anything for granted till he has satisfied himself at least of the probability of its truth, yet, knowing the great difference there is between reason actually contradicting, and reason not being able to explain, because he cannot demonstrate to the contrary of what is set forth in any doctrine, as involving no absurdity, suspends his judgment as far as regards demonstration, till he can prove either for or against. On looking around us, and beholding the great predominance of good over evil, should we cast our eyes upon this apparent anomaly in Nature, viz.—that animals prey upon each other as necessary to their existence, might we not at first be inclined to doubt universal benevolence, till philosophy comes to our aid, and says—'human nature is finite, God all-powerful, Nature profound, and shall Man dare to dispute the goodness of the Almighty because he cannot explain all its manifestations?' I trust not: as true philosophers we should suspend our judgment.

"This, it may be said, is taking a very comprehensive view of philosophy; but is it not so?—Is not that an extended, elevated, and ever gratefully-exciting philosophy which constantly unfolds to our delighted eyes that beautiful connection ever existing between our truest—and therefore purest—sources of real and lasting enjoyments here, and our eternal happiness hereafter? What a foundation—what a preparation of the mental soil, wherein to sow the seeds which are to bring forth the fruits of a sublime religion!

"So much for the real philosophy. This term has, however, been allowed to slip rather from its original meaning; because, taken collectively, it has been sometimes used to signify a class of studies or supposed reasonings, which, although they *originated* in the observation of facts, went further than Nature and just reason warranted them; of this kind, says Professor PLAYFAIR, called by BACON the sophistical, were almost all the physical systems of antiquity. And this is the philosophy (so called) of many of the ancients, who vainly supposed that *reason* (that power which enables us only to perceive relations founded on facts, and confirmed by other facts, the foundation of the Baconian philosophy) was, from a few imperfectly observed phenomena, to conjure up a system, which, as it pretended to explain, was exactly to represent that Nature with which the propounders had not even condescended to compare it.

"Well might this, which was no philosophy at all, be opprobriously termed the pride of Man's philosophy, as distinguished from that which BACON beautifully terms the interpretation of Nature; and truly cautious should we be not to confound this with philosophy, so that by avoiding the one we discard the other; lest we insult the Deity by the abuse of that reason with which he has blest us, and through the help of which we gain both the knowledge of his true glory, and the hope to possess it. As the APOSTLE says, ye shall give a reason for the faith that

is in ye. I have dwelt a little on this principle of connection, in order that I might illustrate both the mode and the importance of taking general and not partial views of Nature."

Resuming the immediate subject of his lecture, Dr. BOISRAGON proceeded to point out the importance of Meteorology, viewed in connection with the various pursuits and occupations of men, and gave a full and comprehensive definition of the term itself. The chief elements comprised in the science were ranged under three general heads, viz.—*air*, *water*, and *luminous meteors*, connected with the operation of which were to be considered their four chief agents—*gravitation*, *light*, *heat*, and *electricity*. The peculiar properties of air were described, and many of the phenomena which result from its *weight*, *transparency*, *electricity*, and *refraction* were briefly adverted to. The effects of heat upon the atmosphere or air were explained, as were the construction of the various philosophical instruments invented for the purpose of ascertaining and determining temperature. With the description of these instruments the lecturer was compelled to close his discourse, the time allowed having expired. The further discussion of the subject was accordingly postponed till Friday.

On Friday evening, February 2, Dr. BOISRAGON delivered his second lecture on Meteorology. After recapitulating the leading points of the first lecture, a brief description was given of the various instruments employed for meteorological observations, and the principles of their construction explained. In speaking of the *aethrioscope*, the nature of hot and cold pulses was inquired into. "The hot pulse, or aerial wave (observed the lecturer), commences from some body or substance imparting a portion of heat to a contiguous particle of air, which thereupon expands; the next particle does the same, depriving the former of its heat, which again contracts; and so on successively,—forming pulses continued into the upper regions, and originating at the surface of the earth. The cold pulses, which are by some thought to be positive cold sent from above, are nothing more than the air deprived of its heat: these also commence at the surface of the earth, being caused by the successive contraction and expansion of the particles of air, as each deprives the particle above it of its caloric." After explaining other phenomena incident to the effects of *heat* upon the atmosphere, Dr. BOISRAGON proceeded to speak of this powerful agent as producing the operation of land and sea breezes, which was illustrated by an ingenious experiment. Adverting to the affections of the barometer from aerial currents, mention was made of KIRWAN's beautiful theory of partial accumulations of air being caused by the higher column at the Equator gravitating towards the Pole, and thereby influencing the course of the currents described—the objections of Lieut. MORRISON to KIRWAN's theory were stated, and that gentleman's views of atmospheric electricity briefly

explained—reference being made to the electrometer recently invented by him, which was produced for inspection.

The nature of *evaporation* was next explained, and the various phenomena identified with this important agent—as the formation of dew, fog, clouds, rain, &c. &c.—severally pointed out; and the various instruments, constructed for measuring and determining the quantities of each, minutely described. The effects of cold and electricity upon the atmosphere were considered, and a brief review taken of the various natural phenomena included in the science of Meteorology. The lecturer concluded his discourse with some apposite remarks on the importance of philosophical studies in general, and appealing to the fairer and gentler portion of the audience, urged upon *them* the importance of looking "upon philosophy with a kindly eye—not considering it as a difficult or uninteresting pursuit, beyond the reach of their capacity, but regarding it as the sure guide to thinking and acting, and esteeming the power of taking a rational or philosophical view as essential to real education; for," continued the lecturer, "it is not necessary that a person should be what is termed scientific to be a philosopher, for a poor person, and even a child give proofs of a philosophical mind when, as they sometimes do, they observe and act truly according to the relations in which they are placed. Besides, who that has once felt the emotion excited by the perception of a grand or beautiful principle in Nature will deny, that this state of the mind, elevated to the contemplation of a sublime first cause, is not in itself an homage—a tacit hallelujah?" This lecture, like the former, was illustrated with a number of interesting experiments.

On the motion of Dr. Conolly, a vote of thanks to the lecturer was carried by acclamation.

On Tuesday evening, Feb. 6, Mr. T. Wright delivered the first of a course of lectures on Fossil Organic Remains. We were glad to see the subject attract so numerous an audience as was present upon the occasion, and we doubt not, as the subject will necessarily increase in interest as it proceeds, that the entire course will prove extensively popular.

In his introduction, which was most eloquently written throughout, Mr. Wright glanced at the rapid progress which physical science had made within the last half century. The discoveries in Chemistry, Electricity, and Magnetism, with those more connected with the subject of his proposed course of Lectures, namely, Geology, and Comparative Physiology, were all briefly alluded to, as themes inspiring sentiments of exalted admiration. Had our limits permitted, we should have been glad to have availed ourselves of Mr. Wright's permission, and extracted largely from this portion of the lecture. As it is, however, we must confine ourselves to one or two of the most striking passages.

"The philosophic mind, in contemplating these triumphs of Man's noblest powers, discovers a wonderful and mysterious relation established by his adorable Creator, between the material universe and his intellectual nature; the noble faculties of his mind, which are his highest and best gifts, and the sources of his purest and most exalted feelings, have been conferred upon him for cultivation; the prospective design of their education; the grand final cause of their conferment, was to constitute him what he is, a moral, intellectual, and religious being; the great object of whose existence ought to be adoration and duty to his God, and love to his fellow men.

"The wonderful mechanism of the universe, the grandeur and surpassing beauty every where displayed in the external world, kindle in his mind a thirst for inquiry, and arouse to action his noblest faculties; the planet we inhabit, by a long series of eventful changes, is sumptuously stored and wonderfully provided for the reception of our species, and every thing is formed in the strictest relation to our nature, and all admirably adapted to call forth the slumbering energies of intellectual powers, and afford Man the fullest scope for exercise of his proud prerogative—reason.

"That the study of the truths of science should in any way be supposed to be at all calculated to lead the mind astray from its first and most sacred duties,—*worship to God, and the contemplation of His revealed Word* with all its sublimities, and assurance of a life of peace and rest beyond the grave,—is a paradox that I humbly confess myself incapable of comprehending; for what (let me inquire) are the arrangements of the universe, but the expression of the will of their Almighty Architect?—what the discoveries of science, but a superficial knowledge of those laws by which the fiat of Omnipotence is maintained? Let not, therefore, our ardent pursuit of truth be checked by any false fears that we may penetrate too deeply into the hidden mysteries of Nature; for, believe me, in all such investigations, if conducted with an anxious desire to behold truth in all its loveliness, and to develope those mysterious faculties of the mind which it has pleased a Bountiful Providence to confer upon us, and with an humble heart to read Nature's vast volume so liberally thrown open for our instruction, is, next to the worship of its Divine Author, an intellectual duty worthy of the heirs of immortality the performance of which calls into healthy activity the soul's noblest powers, and leads to more lofty conceptions—more sublime contemplations of their glorious and beneficial Author."

Referring next to the wonders recently brought to light by the study of Fossil Zoology, the lecturer continued—"Were a superficial observer told that the stone, which records the memory of some dear departed friend, was itself the silent monument left by myriads of animals, whose calcareous parts were incorporated with its constituent particles at the time the rock itself was forming at

the bed of an ancient sea; were he not shewn that no inconsiderable portion of the surface of the earth was originally derived from the skeletons of its former population, that extensive plains and lofty mountains are but the tombs of tens of thousands of beings who spent their happy day upon its surface, and whose remains are the only record of their existence extant, he would be lost in awe and in wonder, seeing that the rocks which support his footsteps—that the mountain chains, which rear in awful majesty their lofty summits to the sky, are but stupendous monuments upheaved from the bosom of the deep, in which lie entombed, as in a vast cemetery, the exuviæ of myriads of animals that tenanted our planet during immeasurable periods of past time, although these domiciles of ancient life now lie piled together in one rude confused mass, yet by a Providence that is truely wonderful, have these *relics of death* slowly undergone those chemical changes by which they are converted into the limestone that forms the *humble* cottage of the peasant, or the marble that adorns the *gorgeous* palace of the prince."

On Feb. 13, Mr. Wright delivered his second Leture on Fossil Organic Remains before a numerous audience; the Rev. G. Bonner, one of the Vice-Presidents of the Institution, being in the chair.

The lecturer commenced by making some general observations on the tertiary strata of our island, showing, by well-executed diagrams, their relative position. The basins of *Hants* and *London* were shown to have been once continuous, but subsequently separated from each other by the rising of the chalk—the plastic clay and London clay in both retaining the same relative position to the cretaceous rocks on which they repose. From a beautiful section of the north-west coast of the Isle of Wight, Mr. Wright demonstrated the disturbance which took place during the deposition of the tertiary system. The singular manner in which the plastic clay and London clay formations, with their accompanying sands, and the chalk and marl beds at Alum Bay, had been uplifted from the horizontal position in which they were deposited to the vertical position which they now occupy, was adduced as a striking illustration of the disturbance which our own island had experienced during this period of the earth's history, and anterior to the deposit of the marine and fresh-water formations first noticed by Mr. Webster at *Headon Hill*; the similiarity between these deposits and those of the Paris basin was pointed out, and the singular character first observed by that geologist, Brongniart's section, namely, their formations being referable to fresh and salt water, the marine deposits yielding the remains of Whales and marine Mollusca; and the fresh-water beds abounding with the bones of quadrupeds, land and fresh-water shells. The age of the crag of *Norfolk* and the *Faluns of Touraine* were indicated, and the remains of the newest tertiary strata were shown to belong to extinct species of living genera,—whereas the quadrupeds

of the older tertiary rocks were described as animals belonging to extinct genera. The erratic blocks, scattered over the surface of all continents, were adduced as evidence of the Noakian deluge recorded in the inspired narrative. Having made these general observations, Mr. WRIGHT proceeded to describe the Mammalia whose remains abound in the older tertiary rocks, the discovery of which was due to the late Baron CUVIER; the genius and industry of this great philosopher was in none of the departments of animated nature more strikingly illustrated than in his laborious and successful researches into the laws that regulate the development of animal structure, by which he dispelled, as it were, the mists that had enshrouded his predecessors in the same path of inquiry.* The unity of organic structure was exemplified by a train of reasoning intended to show that every part of animated bodies has an invariable and constant relation to all the other parts of their economy, and that any deviation in one organ or system produces a corresponding modification in all the others; this was strikingly illustrated by a general sketch of the organization of a carnivorous and of a herbivorous quadruped. The lecturer said that the same laws pervaded the most simple as well as the most complicated animals; they were the same in the Worm as in Man himself; but that the limits of his present lecture would not permit him to enter at greater length on this fascinating branch of philosophical Zoology.

The extinct genera of the first fresh-water formation were described, and the generic characters of *Palæotherium*, *Anoplotherium*, *Anthracotherium*, *Chiropotamus*, and *Adapis*, illustrated by beautiful plaster-casts of the skulls of some of these animals, which had been presented to the Institution by Dr. CHICHESTER. Of the new genus established by Professor KAUP, the *Dinotherium*, the remains of which were discovered at Epplesheim, in Hesse Darmstadt, Mr. WRIGHT gave a general sketch, and of the supposed form and habits of this animal, from KAUP's restoration, together with Dr. BUCKLAND's conjectures. From the opinions of these professors the lecturer however dissented, and adduced

* The lecturer here introduced the strikingly grand passage from this great zoologist's introduction to his description of the bones from the fresh water strata of Mont Martre:—"I found myself placed as in a great charnel house, surrounded by the mutilated fragments of a hundred skeletons, belonging to more than twenty different kinds of animals, piled confusedly around one; it was required that every one should be joined to its fellow; it was a resurrection in miniature, but the immutable laws prescribed to living beings were my directors. At the voice of Comparative Anatomy—each bone—each fragment of a bone resumed its place. I have no expressions to describe the pleasure experienced in observing as I discovered one character, how all the consequences which I predicted from it were successively developed. The feet were in accordance with the character announced by the teeth—the teeth in harmony with those indicated beforehand by the teeth—the bones of the legs and thighs, and every thing that ought to unite these two extreme parts, were conformable to each other precisely as I had arranged them before my conjectures were verified by the discovery of the parts entire—in a word, the animal was reconstructed, as it were, from a single bone of its component parts."

ample anatomical evidence from KAUP's figure of the nearly-perfect skull, discovered in the same locality in 1836, to show that it could not have been supported on the spine of a terrestrial animal; seeing that the superior and posterior parts of the cranium wanted those compensative contrivances which exist in the crania of terrestrial Mammalia which possess ponderous skulls. This was exemplified by referring to the crests and prominences already alluded to, which characterize the skulls of the Elephant, Horse, Boar, Tiger, and Dog. The lecturer then alluded to the condyles in the skull of the *Dinotherium*, which were placed in the direction of the longitudinal axis of the head; this he compared with the same articulating processes in the Dugong, Lamantin, and Porpoise, and showed the striking affinity which exists between the *Dinotherium* and the skull of the Dugong. Similar opinions had been recently expressed by some of the most eminent comparative anatomists of the French School. He next described the character of the molar teeth, showed their affinity to those of the Tapirs and other Pachydermes, and their near approximation to the *Cetacea*; the wonderful form of the lower jaw was described as a unique specimen of organic structure, and the singular manner in which its anterior third is arched downwards, to carry two enormous tusk incisors demonstrated,—the nearest analogy to which exists in the Dugong; these were viewed in reference to the probable aquatic habits of the animal, and were regarded as rakes for tearing up submarine vegetation. From a minute anatomical review of its singular organization, the lecturer infered that the *Dinotherium* was a marine animal, nearly allied to the Dugongs and Lamantins, which inhabit the seas of the Torrid Zone, and could not be supposed to have any affinities with the lacustrine quadrupeds as stated by KAUP and BUCKLAND; these opinions he had formed anterior to the publication of DUMÉRIL and DE BLAINVILLE's views—to which he had been led by a similar process of reasoning.

The Mammalia of the *Elephantoidal* period of the tertiary strata next engaged the lecturer's attention, a large proportion of which belong to the Pachydermes, as the Elephant, Hippopotamus, Rhinoceros, Horse, and numerous ruminants, on the inordinate increase of which Carnivora of the order of Lions, Tigers, Hyænas, Wolves, and Bears roamed through the forest, or lurked in the dens and caves, to desolate the then existing animal kingdom. The general character of the earth's surface during this epoch, he observed, must have been very different from that of the present day, for we can adduce the most conclusive evidence to shew that the extreme regions of the North, and the shores of the Icy Sea, possessed a temperature nearly equal, and a vegetation as luxuriant, as that which now clothes the dry land of the Torrid Zone. In support of this opinion the lecturer adduced the fossil Elephant, which was found sealed up in a block of ice near the mouth of the Lena, with its skin and flesh so well preserved that it

was employed for feeding the Dogs of its discoverers. The abundance of Mammoths, bones, teeth and tusks which occur throughout the diluvium of Russia, Eastern Siberia, and the Arctic Marshes was described as evidence of the last great catastrophe recorded in the inspired narrative. The superficial strata of Poland, Germany, Bohemia, France, Italy, and of almost every country in the British Islands were shewn to contain the fossil bones of Elephants. The ossiferous caves of Europe were next alluded to, and the specific characters of the extinct species of this gigantic genus, now confined to Asia and Africa, pointed out, from which examination it appeared that the fossil Elephants approached more closely to the Asiatic than to the African species. From the various characters of fossil teeth, it was supposed that we possess at least the remains of six distinct species. The dental formula of the Mastodon and the organization of its skeleton was compared with that of the Elephant.

The gigantic Mastodon, the remains of which are peculiar to the American continent, was first described, and its generic characters distinctly pointed out; remains of the smaller or narrow-toothed Mastodon are common to both hemispheres; the characters of this genus repose on the form which the worn surfaces of their teeth present, and on some osteological modifications which the lecturer demonstrated. The zoological peculiarities of fossil Rhinoceroses were next alluded to, and their affinities indicated as forming interesting links that connect the present isolated species of this gigantic genus with each other, and the entire group with other *Pachydermata*, and the lecture concluded by demonstrating the singular organization of the *Megatherium*.

Mr. WRIGHT resumed his lectures on Fossil Organic Remains on Feb. 20, when he delivered the third lecture of the course. The lecture table was crowded with illustrative specimens, and a great number of very beautifully-executed drawings of the various remains to be described covered the wall above.

The lecturer gave a sketch of the relative position of the secondary strata, described the formations which compose the saliferous, oolitic, and cretaceous systems, and made some allusion to the probable condition of the globe during the deposition of the secondary rocks, and shewed that the animals which tenanted the air, the land, and the waters of these periods of the earth's history were altogether different from any thing that we are at present acquainted with. Mr. W. described the leading features of the class reptiles, and demonstrated the modification of the structure on which their classification into Chelonians (Tortoises), Saurians (Lizards), Ophidians (Serpents), and Batrachians (Frogs) repose. Fossil reptiles, he said, had been grouped by VON MEYER into marine, terrestrial, and aerial, &c. He intended to follow this arrangement in the present lecture. The *Ichthyosaurus*, or Fish-lizard, being the most singular of all the marine Saurians, was first described. The lecturer entered fully into the peculiarities of its

structure, and showed the singular compound character of its skull, which combines the cranium of a Lizard with the jaws of a Porpoise, armed with the teeth of a Crocodile, and described the series of bony plates which surrounded the sclerotic coat of the immense eye of that creature, and stated that he had first described their affinities to the sclerotic plates of Tortoises and Iguanas and other reptiles, and their use in the mechanism of the organ of vision, adapting that wonderful instrument to receive the rays of light through media of varied density, in a lecture he delivered upwards of two years ago before the members of this Institution, a full report of which was contained in the *Cheltenham Chronicle* of the 10th of December, 1835. He thought it was but justice to himself to be somewhat particular about dates, as Dr. Buckland had received a vast deal of credit for having pointed out, by a similar train of reasoning, the probable uses of the plates. The lecture alluded to was delivered upwards of twelve months anterior to the publication of the Doctor's treatise, and if merit was due to any one it was assuredly due to him (Mr. Wright). The mechanism of the spine was next described, and the singular character of the vertebræ compared with those of fishes, which they most closely resembled. The disposition of the several processes was viewed in reference to the aquatic habits of the animal, and the evidence of prospective design which the entire column afforded clearly pointed out. The form of the thorax and the disposition of the ribs next engaged the lecturer's attention, and he gave a luminous exposition of the wonderful mechanism of the extremities, and showed by numerous examples that the paddle of the Ichthyosaurus, which at first sight so closely resembled a tesselated pavement, was composed of precisely the same elements that we recognize in the human arm, fore-arm, and hand, and so far from being a monstrous production, affords a fine example of that harmony of composition which we everywhere discover in the mechanism of organic forms. The entire structure of this wonderful reptile showed that it was admirably adapted for swimming with great rapidity through the sea, and from the armature of its jaws, that it was highly carnivorous in its habits. From the demonstration of its skeleton the lecturer proceeded to describe the probable character of its digestive organs, which from the form of the petrified contents of the intestinal canal, called *coprolites*, found with its shattered skeleton, were conjectured to resemble that of the Dog-fish. This opinion was founded on the fact that some coprolites presented a peculiar spiral form, which was supposed to be occasioned by the inner membrane of the canal in which they were contained being provided with a spiral valve, like the spiral valve of the Dog-fish, or the corkscrew disposition of that canal in the Sword-fish.

The *Plesiosaurus* was described as a creature which approached existing Lizards still more closely than the preceding; it was distinguished from all other animals

in the wonderful development of its neck, having in this region of the spine no less than thirty-five bones, being one-third more than is found in any other living or extinct animal. This enormous neck, which resembled the body of a Serpent, was capable of being flexed into the elegant S-shaped curvature so beautifully shown in our Swans: the paddles of this reptile were between the Cetaceous character of the preceding genus and those of existing Lizards, and supply us with interesting links in the series of organic forms. The spine is arranged with a view to give greater solidity to this region of the body, and the tail is extremely short, affording a striking contrast to that of the Ichthyosaurus. From the solidity of the articulations of the spine, the length of the neck, the shortness of the tail, and the development of the extremities, the Plesiosaurus is supposed to have frequented shallow seas and estuaries, from being incapable of braving the open main.

The *Mosasaurus* was described, and its affinities to the Monitors demonstrated; in reviewing the history of the marine Saurians, the lecturer observed, that the Carnivorous reptiles were the ruling despots of the ocean, during the periods the oolitiferous sea rolled its wilderness of waves over our present continents, before whose power of speed, whose weapons of destruction, and whose cunning and predaceous habits, all the tenants of the deep, when brought within their grasp, were alike constrained to yield.

But the dry land, as well as the waters of those middle ages, was tenanted by strange gigantic forms of the same class, organized for subsisting upon a vegetable regimen. The lecturer described the enormous terrestrial herbivorous reptile discovered by Mr. MANTELL, in the Wealden beds, which he called the *Iguanodon*, from the circumstance of its teeth resembling those of our modern Iguanas. This wonderful reptile was supposed by that gentleman to have attained the enormous length of *seventy feet*, and the proportion of its several parts, obtained by a rigorous comparison between the volume and dimensions of the fossil bones and teeth with those of the Iguanas of our day, were as follows:—

Iguanadon—the length	70ft. 0in.
Length of the head	4ft. 6in.
Length of the body	13ft. 6in.
Length of the tail	52ft. 0in.
Height from the ground	9ft. 0in.
Circumference of the body	14ft. 6in.
Length of the thigh and leg	8ft. 2in.
Circumference of ditto	7ft. 6in.
Length of the hind foot	6ft. 2in.

The lecturer here compared the dental formula of the Iguana with that of the Iguanodon, and stated that the teeth of the latter appeared to be but magnified

representations of the former; and described the general character of this enormous Lizard, which once roamed through the primeval forests that clothed the southern regions of our island.

The *Hylæosaurus* (Lizard-of-the-Weald) is another genus discovered by Mr. MANTELL, and supposed to have been between twenty and thirty feet in length, and to have been furnished with a large erectile fringe, supported by bony spines, seventeen inches in length, which rose from the centre of its back. The Megalosaurus, discovered in the Stonesfield slate, was a terrestrial Carnivorous reptile, intermediate in its organization between the Crocodiles and Monitors. This creature is supposed to have attained fifty feet in length, and to have waged a fierce war on the *Plesiosauri*, *Crocodilidæ*, and other *Reptilia:* the colossal character of the skeleton, and the formidable structure of the sabre-shaped teeth which armed its jaws, were demonstrated, and its organization was shown to have been well adapted to its sanguinary habits.

Mr. WRIGHT's fourth lecture on Fossil Organic Remains was delivered on Feb. 27, in the lecture-room of the Institution, before a numerous audience.

In resuming the consideration of Fossil Reptiles Mr. WRIGHT glanced briefly at the leading facts which he had explained in his last lecture, regarding the adaptation of their structure to their habits; he next entered upon the history of the Flying Saurians, which he described as the most singular forms of animal life yet discovered among the ruins of the ancient earth. "To mould and adapt the typical structure of reptiles," said he, "into a form capable of soaring through the higher regions of the air, centres such a variety of contrivances, and produces a form so anomalous, that when the nearly-perfect skeleton of a Pterodactyle (or wing-toed animal) was exhumed from the calcareous cemetery which had enshrouded it for ages, the most learned naturalists were at a loss to decide to what class it in reality belonged; thus, BLUMENBACH regarded it as a bird, and SOEMMERING as a Bat; but the structure of its dentiferous jaws, the form of its breast-bone and scapular arch, with the organization of its members, alike showed that it was a reptile which had once winged its way through the liquid air. The remains of six species have been found in the lithographic limestone of Aichstadt and Solenhofen, and two species in the lias of Lyme Regis and the Stonesfield slate near Oxford." The lecturer detailed the wonderful mechanism displayed in the skeletons of these reptiles, and drew an interesting comparison between them and the skeletons of other vertebrated animals destined for an aerial life, as the Bats, birds, Flying-dragons, and Flying-fishes. It appears, from Mr WRIGHT's description, that the Pterodactyle differs from all other animals, either living or extinct, in the compound character of its anterior members,—the inner fingers of the hand being armed with sharp claws, like other Lizards; whilst the outer finger is enormously developed,—its length equalling that of the entire body.

This rod-like finger formed the framework which supported a membranous wing, by which this wonderful creature was enabled to fly in pursuit of the myriads of insects that fed on the honeyed nectar of the flora of the ancient land. In concluding his description of this family, he remarked that their structure formed the passage, in a most remarkable manner, from the low organization of the cold-blooded Vertebrata to the more complicated mechanism of birds and Mammalia; and that the peculiarities of structure, by which these creatures were linked with them, were neither few, nor difficult to demonstrate; these the lecturer pointed out in a most satisfactory manner, by reference to numerous anatomical specimens and diagrams. He next proceeded to the consideration of Fossil Crocodiles, and dwelt upon the curious fact first observed by Cuvier, and confirmed by subsequent discoveries, that the fossil *Crocodilidæ*, found in the saliferous, oolitic, and cretaceous systems, were allied to our modern long-nosed Gavials, whilst those found above the chalk approached the broad-muzzled Alligators and Crocodiles. The lecturer drew some interesting inferences from these facts regarding the character of the animals, on the too rapid increase of which these fossil Crocodiles were destined to keep a vigilant check. In reviewing the history of the reptile age, Mr. W. gave some satisfactory physiological reasons for supposing that the arctic land, during those periods of the earth's history, enjoyed a much higher temperature than it does now. The history of fossil fishes was next introduced, and the lecturer remarked that this branch of Palœontology was rapidly advancing through the zeal and industry of Professor Agassiz, the great master of this department of Fossil Zoology. He described the condition in which the remains of the finny tribes were found, and the localities in which they occur; and the interesting facts which had been revealed by Agassiz' labours, that none of the many hundreds of genera now existing are found in any formation older than the chalk; that in the upper members of this system there are among the many extinct genera only five which are now living; that of the fossil fishes, discovered in the older tertiary strata, one half belong to existing genera, the other half to kinds that are now unknown. These discoveries harmonize in the most interesting manner with similar results obtained from an investigation of fossil reptiles and Mammalia; and show, in a satisfactory manner, the close affinities which exist between the tertiary period and the existing order of Nature. The lecturer then explained the peculiar features of that learned naturalist's classification, and showed how intimately the scaly covering of fishes is related to the other parts of their economy, and how peculiarly adapted his views are to the advancement of Fossil Ichthyology; seeing that, in a vast number of instances, it is the scaly covering of these animals alone that has resisted the rude destroying hand of time. He detailed, from specimens and diagrams, the character of the fishes found in the different formations, from which

it appeared, that in proportion as we rise from the ancient to the more modern systems of strata, the ichthyoid reliquiæ approximate in their form and dermal covering the fishes of the present epoch. The change which appears to have taken place in the form of the tail of fishes after the deposition of the magnesian limestone was particularly dwelt upon; namely, that in those found in the Silurian and carboniferous strata the tail was unequally bilobed, whereas those entombed in the upper formations of the saliferous, oolitic, and cretaceous systems have the tail equally bilobed. As the large Lizard-like fishes were the dominant class in the seas anterior to the creation of the reptiles, they attained enormous magnitude during the carboniferous era; into the waters which had deposited the magnesian limestone, however, reptiles were for the first time introduced, and these took the place of their ichthyoid predecessors. The lecturer described some of the striking forms which characterize the different systems of strata, and showed that important changes had taken place in the family of Sharks, certain sub-families being confined to particular formations; and how that the present forms of that voracious family, with lancet-shaped teeth, had been created about the period that the last of the long line of marine reptiles had become extinct. In entering upon the consideration of Fossil Invertebrata, Mr. W. observed that it would be impossible to describe, as minutely as he wished, the organization of this highly-interesting division of his subject, seeing that his course was limited; he would therefore select those fossils which the student is most likely to encounter in his rambles. The lecturer gave an outline of the organization and classification of molluscous animals, and described the most important traits in the structure of the *Cephalopodes*, or those which have their arms or tentacules disposed around the head, like the Cuttle-fish. Before describing the fossil genera of this class, he observed that it would be desirable to impart a correct notion of the peculiar structure of the living representative of the testaceous group of this class, which in byepast ages had fabricated and inhabited those singularly abundant fossil shells, called Ammonites, Baculites, Scaphites, &c. The *Nautilaceæ*, he said, were once an extensive family, and the last descendant of this line was the constructor of that elegant shell called the Pearly Nautilus, now on the table. This shell is a conical tube, which is coiled upon itself; internally it is divided into a series of air-chambers by transverse partitions. Through the centre of each division is a small hole, which in the recent state communicates with a pipe that runs through all the chambers. This pipe terminates in a sac or reservoir, which surrounds the heart of the creature. Dr. Buckland, in his late treatise, founds a theory upon the action of this pipe or siphuncle, which may be thus briefly stated. He supposes that the undulation of the fluid from the bag to the pipe, by compressing the air in the chambers of the shell, so alters the specific gravity of the animal, that by these means it is enabled to ascend or

descend into the water. That this is erroneous must be evident to any one who reflects that this theory allows only of a *change of place* in the balancing fluid, consequently the *aggregate weight* of the animal and its shell remains the same. The error into which the Doctor has fallen arises from his having overlooked the fact that the pericardial bag communicates before by two openings with the branchial cavity, into which the sea-water is constantly flowing to bathe the gills; whilst posteriorly there proceeds from the sac a membranous tube that passes through all the air-chambers of the shell. Thus, when the animal is creeping upon its fleshy foot at the bottom of the sea, the water, admitted by the openings just alluded to, distends the bag, and then flows through the entire tube; it is clear, therefore, that the weight of the sea-water contained in the bag and siphuncle is the amount of ballast necessary to retain the animal at the bottom, by rendering it specifically heavier than the ambient fluid; but supposing the Nautilus desires to rise to the surface, all that is required to render it specifically lighter is to get rid of its watery ballast. This it accomplishes by contracting the bag, and ejecting the fluid through the openings that communicate with the branchial cavity; a partial vacuum being thus produced in the bag,—that portion of the water which had distended the pipe now flows into it, and a second contraction is all that is requisite in order to render the animal and its shell specifically lighter; and thus it is enabled to rise to the surface. When it wishes to descend it admits the sea-water, becomes heavier, and gradually sinks to the bottom.

The concluding lecture of Mr. Wright's course on Fossil Organic Remains was delivered on March 6, to as numerous an audience as had attended either of the four preceding lectures.

Mr. Wright demonstrated the organization of the *Nautilaceæ*, and described the mechanism by which these syphoniferous mollusks are enabled to ascend and descend in the water. From the consideration of the living representative of this once-extensive group, he proceeded to describe the fossil *Nautili* of our neighbourhood, each system of rocks having forms peculiar to them. The Orthoceratite and Lituite were shown to be genera of this family, that commenced and terminated their career in the waters that deposited the transition series. The *Ammonitidæ* are an extensive fossil family, composed of five genera, each of which have received names from their supposed resemblance to particular objects. The Ammonites have the shell-discoidal more or less compressed, and the spine rolled upon the same plane; the partitions terminate in flower-like ramifications upon the surface, and the last chamber is very capacious, and lodged the body of the animal; the surface of the shell is ornamented with an immense variety of forms, as ribs, flutings, tubercles, &c., which are disposed with exquisite symmetry over the entire shell. These are so many mechanical contrivances for

increasing the strength of the arch, and compensating for the lightness and delicacy of the materials that composed the frail habitation of this ancient Mollusca. This genus has been divided into fifteen sub-genera, including, in all, about three hundred species,—their size varying very much: some are not more than a line in diameter, whilst there are some found as large as a cart-wheel; the specimen on the table, from the lias of Badgworth, is upwards of two feet in diameter. *Baculites* are straight Ammonites, just as the Orthoceratites are straight Nautili: the six species of this genus are altogether confined to the chalk. *Hamites*, so called from their hook-shape, are found in the upper oolitic and cretaceous systems: of the thirty species known, twenty-eight belong to the latter, and only two to the former. *Scaphites* are boat-shaped Ammonites, and their singular form is owing to the shell having taken a particular direction at a certain period of its development: they are found in the upper formations of the secondary strata. *Turrilites* have a spiral shell, curled round like a winding tower, and gradually diminishing in diameter from the base towards the apex. Of the seven species of this genus, one is found in the coral rag, three in the green sand, and three in the chalk; thus the *Ammonitidæ* may be traced through all the fossiliferous strata up to the close of the secondary period. The Ammonites extend through all the formations included between the transition limestone and the superior members of the cretaceous system: other genera, however, were introduced and terminated their career with particular systems or formations. The Orthoceratites are found only in the transition rocks, the Scaphites and Turrilites in the upper oolite and chalk, and the Baculites are confined to the latter formation: the *Ammonitidæ* are entirely absent from the the tertiary strata. After describing numerous fossil genera of naked Cephalopodes, nearly allied to the Cuttle-fish, the lecturer proceeded to describe the internal organization of the Loligo, showing the relation of the horny internal rudimentary skeleton; he next entered upon the history of those singular fossils which are so abundant in our locality, called Belemnites, and which once formed the internal skeleton of a naked mollusk, probably not unlike the Calmar (or Pen-and-ink-fish) of our coasts. He demonstrated the complicated structure of these singular fossils, and showed how they were composed of three distinct portions—first of an elongated cone, which is more or less compressed, and, when fractured, is seen to be composed of a remarkable calcareo-fibrous structure, which, when burned, gives out a strong smell: the fishes radiate from the centre. Secondly, of an alveolus or chambered shell, embedded in the substance of the fibrous cone. Thirdly, of a delicate sheath, which expands from the base of the elongated cone, and was destined to lodge and protect the ink-bag which has been found *in situ* in some specimens obtained from the lias. The *Belemnitidæ* were introduced into the seas that deposited the oolitic system: seventy-five species are found in the lias and oolites,

and eight species are peculiar to the chalk. After the deposition of the secondary rocks they all became extinct. As illustrative of the history and organization of the Foraminiferous Cephalopes, the lecturer described the nummulite which was so abundant in some localities; a limestone rock, composed almost entirely of this fossil, was that of which the Pyramids are built. Mr. WRIGHT gave a general sketch of the organization of the *Casteropoda* and *Conchifera*, and explained the character of some of the genera of these classes, which are so very abundant in our neighbourhood; and he detailed the striking disparity between the Herbivorous and Carnivorous trachelopodes in the older rocks, and showed that the part which was once played by the Cuttlefish tribe, in checking their increase, was, after the extinction of the *Ammonitidæ*, performed by Carnivorous Casteropods, singularly adapted to wage war upon the almost defenceless *Herbivora*. The lecturer gave a general sketch of the organization and classification of the Articulated animals, and observed that, although above a hundred thousand species of insects are deposited in our museums, and which number was supposed to be far short of the number existing, yet this extensive class were almost altogether absent in the stratified rocks; fossil insects are found in the coal formations and in the oolitic system; and above sixty genera are known to exist in the tertiary strata. The class *Crustacea* next engaged the lecturer's attention, and he demonstrated the fossil Crabs, which are found in such abundance in the London clay of the isle of Sheppey, from numerous specimens on the table, from that locale. The genus *Astacus* was described, and the species from our neighbourhood shown which had lately been figured in the *Illustrations of the Geology of Yorkshire*. The singular and ancient family *Trilobitidæ* were described, and their organization and classification amply illustrated by numerous specimens and drawings, representing some of the most interesting genera. The faculty which *Calymene* enjoyed, of rolling itself into a ball like the Glomeris and Armadillo, was alluded to; and the affinities which exist between the Trilobites and other isopodous Crustacea satisfactorily demonstrated. The fossil Cypris was described, and the history of the species abundant in our neighbourhood detailed, to explain the wonderful abundance of the horny shells of these microscopic Entomostraca in some tertiary fresh-water formations. The character of the genus *Limulus* was described, and the lecturer entered upon the history of Fossil Radiata. He demonstrated the organization of the Echinodermata, and showed the interesting gradations of structure observed in this class, from the globular shell of the Echinus to the radiated form of the Starfish: this was rendered very familiar by dividing the skin of an orange into five segments, which, retained *in situ*, produced a form analogous to the Common Urchin; but which, when folded down, assumed the characteristic shape of the Starfish. The gradations of structure presented by the different genera of the *Stellirida* were next described, and

the connecting links between this family and the *Ananchytes* demonstrated; the only living representative of which is the Pentacrinus (*Caput Medusæ*) of the West-Indian Seas. The lecturer gave the history of this ancient family of fixed radiate animals, and explained their singular structure, and showed the affinities between them and the Starfish, Ophiura, and Euryale of our seas. In conclusion, Mr. WRIGHT observed, "In reviewing the vast number of facts I have submitted for your consideration, I trust I have succeeded in convincing you that the study of fossil remains, and of the strata that contain them, can no longer be supposed to lead the mind astray from its first and most holy duty—the worship of its Adorable Creator. Is is possible that the Christian's fondest and dearest hopes can be at all weakened by surveying the stupendous grandeur of the material world?—that his assurance of a future can be at all weakened by contemplating the immensity of the past? No, it cannot be. Geology, so far from being opposed to the religion of the Bible, is the only science that is capable of demonstrating that a special Providence alike directs the fiery vomit of the volcano and the development of the zoophyte; it teaches Man that there was a time when no living thing animated the primeval ocean; that there was a starting point—a beginning; it shews him that the regulating hand of Omnipotence has, through all the immensity of the past, adjusted and maintained the economy of our planet; that peculiar forms of animal life were created, to perform a certain part in the "police of Nature;" and that, when that part was no longer required, they were annihilated, to give place to others better adapted, by some new feature in their organization, to the character of the changing scene they were for a brief span destined to animate; and finally, Geology shows that, when the appointed time had arrived, Man—stamped with the image of his GOD—was placed upon its surface, just at that period when the external world had been prepared, by a long series of eventful changes, for his reception; with the furniture of the universe wonderfully adapted to his nature, and calculated to arouse to action his noblest faculties. It is thus the brilliant discoveries of modern Geology become the handmaids of natural theology, and show, in the most striking and satisfactory manner, the unity of the stupendous design and creative intelligence of the GREAT FIRST CAUSE; for whilst the crust of our planet was destined by its Creator to pass through a series of successive though turbulent changes, still do we find the structure and functions of the myriads of animals that have lived and died upon its surface, through all the periods of geological chronology, to present the same exquisite organization—the same perfect adaptation to surrounding nature, and to their varied habits and instincts, as the countless numbers of happy beings that fill, with life and activity, the air, the earth, and the waters of the present day.

At the close of the lecture the President of the Institution (Dr. BOISRAGON)

addressed the meeting, and took a brief review of Mr. Wright's very able and beautiful course of lectures, just concluded. He then glanced at the progress of the Institution during the past year, and announced that the Annual General Meeting of the Society would take place on Tuesday evening next, when the Officers and Committee for the year ensuing would be elected.

CHAPTER OF MISCELLANIES.

ZOOLOGY.

The American Wigeon taken in Lincolnshire.—A specimen of the American Wigeon, taken in the Lincolnshire Fens, was exhibited at the last meeting of the Zoological Society, by Mr. Blyth, being the first known instance of the occurrence of this species in Europe.—Ed., *April* 11, 1838.

Submarine Wood at Bootle.—By order of the Corporation, a sewer has lately been making at a place called Beacon's Gutter, the boundary line of Liverpool on the north shore; and the men in digging have found a great quantity of hazel-nuts imbedded in a sort of peat formed of decayed wood. They were found about eight or ten feet below the surface. Between high and low water mark large pieces of Oak have been found in a very good state of preservation, the interior being quite hard, and fit for fire-wood. Many of the nuts appear to have been gnawed by Squirrels or Mice; some of them crumble to pieces on being handled; but the shell of a great many is tolerably firm. Large quantities are in possession of different individuals.—T. B. Hall, *Woodside, near Liverpool, March* 1, 1838.

Occurrence of the Otter (*Lutra vulgaris*) near Cupar.—No less than five of these piscatorial quadrupeds have within these three weeks been taken in the Eder, near Cupar, and of some the stuffed skins, in others the skeletons, are being prepared for the museum of the Literary and Antiquarian Society. One fine animal having been caught with a stamp, and being but slightly injured, was last week sent off to the Zoological Society's collection, Regent's Park, London, which has been for some time past without any specimen of a live Otter. The anatomy of the head of the Otter is in some respects peculiar. The jaw-bone, instead of working with a simple joint or condyle and capsule, as in other Mammalia, is fastened by a ball and socket joint, the ball being so far inclosed by the socket that, without fracture of the bone, dislocation is impossible. The teeth, again, are sharp and clasping, so that when the jaw is shut, their outline presents an acute angled zig-zag. From these causes, few animals give a more

savage bite, or take a firmer hold, than the Otter, Nature having thus adapted it for the seizure and retention of its smooth-skinned powerful finny prey, when sweeping through the water, or struggling in the agonies of death.—*Fifeshire Journal, Jan.* 25, 1838, *communicated by Mr. Henry Buist, Law Park, near St. Andrews.*

BOTANY.

Proportion of Forests to the Rest of the Soil in Europe.—According to a statement in the French papers, the proportion which forests bear to the rest of the soil in Russia, Sweden, Norway, and Germany is one third; in Austria and Prussia, one fourth; one-fifth in Belgium; one-sixth in Switzerland; one-seventh in France; one-ninth in Italy; and one-twelfth in Spain. The British Islands have only the twenty-fifth part of their territories covered with forests.—*Athenæum, April* 7, 1838.

Enormous Mushroom.—A Mushroom, attaining the almost incredible size of three feet one inch in circumference, and from which very nearly a pint of ketchup was extracted, was last week gathered in a field belonging to P. J. P. Burman, Esq., Henley-in-Arden, Warwickshire.—*Guide, Oct.* 14, 1837.

Effects of the Frost in the Horticultural Gardens.—The late severe winter has caused considerable devastation amongst the hardy and semi-hardy plants. There is scarcely a New Holland or Chili plant that has escaped, and many that have for years stood constant exposure to the weather, have this year been totally destroyed. Amongst these are several fine Arbutuses, of all the specimens in the garden only one remaining; several Acacias, and also Junipers, many of which it was imagined would have borne a climate like that of this country. These results must be considered as very unfortunate by the horticulturist, as fatal to many experiments for acclimitizing plants which are natives of warmer regions in this country. A great devastation has also taken place amongst the Roses, but many which were considered dead show fresh signs of vitality from the improved genial state of the weather. As a proof of the variable state of the weather, it may be stated, that whilst on March 29, at the gardens, the thermometer stood at 62° Fahrenheit, on April 1, it was as low as 16°.—*Morning Chronicle.*

Effects of the Winter.—The different agricultural reports give deplorable accounts of the destruction of shrubs and evergreens by the frosts; even the Ivy has been affected by them. In one part of the county of Berks there is only one garden that contains any Brocoli alive, and what is remarkable, it is situated on the top of one of the most exposed chalk hills in the county! The occurrence is accounted for by the fact that at some periods the frosts are more severe in the

vallies than on the mountains.—*Gloucestershire Chronicle, April* 14, 1837. [We have seen and received many notices of a similar nature to the above.—Ed. Nat.]

GEOLOGY.

Antediluvian Remains.—A specimen of an antediluvian monster of the *Ichthyosaurus* tribe has this week been discovered in a quarry at Twerton, the property of C. Wilkins, Esq. It is a petrified skeleton embedded in lias, of which the huge jaws, teeth, vertebræ, and ribs are perfect.—*Bath Journal, as quoted in the Derby Reporter, March* 26, 1838.

Carbonized Tree.—A tree in a complete state of carbonization has been found at Guadaloupe, buried in the midst of volcanic substances. There was no vestige of leaves; it was broken seven feet below the first branches, and the fracture resembled that of trees destroyed by a hurricane; it was at intervals surrounded by a parchment-like cylindrical substance, the colour of a dead leaf, which was the remainder of a vegetable, called in that country the "burning Liana," which is as succulent as the Cactus, and which, being suddenly exposed to a violent heat, lost its aqueous particles without the entire destruction of its bark. The whole was found in a stratum of red puzzolanum mixed with pumice. The charcoal to which it was reduced, was the same as that used for domestic purposes, except that a slight smell of coal was exhaled from it during combustion. Six different strata laid above this tree; the uppermost, of vegetable earth, proved the antiquity of the whole, and this, combined with the distance from the present active volcano, makes it probable that the irruption which covered it proceeded from the Huëlmont group, of which the Caraïbe forms the principal summit.—*Athenæum, March* 24, 1838.

REVIEWS OF NEW PUBLICATIONS.

Prodromus Systematis Naturalis Regni Vegetabilis; sive Enumeratio contracta Ordinum, Generum, Specierumque Plantarum huc usque cognitarum, juxta Methodi Naturalis Normas digesta. Auctore Aug. Pyramo De Candolle. Pars sexta: sistens Compositarum continuationem. Parisiis: *Treuttel et Würtz.* —London: *Henry Kernot,* 59, Greek-Street, Soho-Square. 1837.

Here we have the sixth volume—containing nearly 700 pages—of De Candolle's elaborately-composed *Prodromus*. The characters of the various groups and species of the vast order *Compositæ* are given in Latin, in a concise and comprehensive manner. The volume is, of course, not calculated for the purposes of the reviewer; and both the work and its learned author are so well-known and justly appreciated by the botanical world, that further criticism appears needless.

The Naturalist's Library. Vol XX. *Birds of Great Britain and Ireland.* Part i. *Birds of Prey.* By Sir William Jardine, Bart., &c. London: *S. Highley.* 1838.

The volume before us opens with a brief memoir of Sir Robert Sibbald. After working through the pages devoted to his pedigree, &c., we are informed that he was born at Edinburgh, April 15, 1641. He received the rudments of his education at the High School of Edinburgh, and in due time entered the University of the same city, where we learn that "he studied hard, shunning all plays and amusements." On March 23, 1660, Sibbald embarked in a Dutch frigate, and proceeded to Leyden, where he remained a year and a half, prosecuting his medical studies. He took his degree of M.D. at Angiers, on July 17, 1662, and returned to the Scottish metropolis in October of the same year. About the year 1666, the return of Dr. Andrew Balfour from France was the means of exciting Dr. Sibbald to more particular attention to the study of Natural History. A short time after, Sibbald, Balfour, and Murray—the Laird of Livingstone, "a great botanist"—established a Botanic Garden at Edinburgh. On April 25, 1677, Dr. Sibbald married Anne, second sister of Mr. Lowes, of Merchison, and two or three years afterwards he formed an intimacy with the Earl of Perth. By the influence of this nobleman, he obtained a patent from Charles II., constituting him his Majesty's geographer for Scotland, together with another appointing him his physician there. In 1681, Dr. Sibbald was highly instrumental in the establishment of the Edinburgh College of Physicians, and at the commencement of the succeeding year received the honour of knighthood. In 1684 appeared his "*Scotia Illustrata*, sive Prodromus Historiæ Naturalis," which is his principal work on Natural History. After a narration of the surprising convertion and reconversion of Sir Robert, we are furnished with several interesting letters to his friends. The exact period of his death is not known, but is presumed to have occurred in the year 1722. At the conclusion of the memoir a list of Sibbald's works, with dates of publication, &c., is furnished.

We must now take a glance at that portion of the volume devoted to the British birds of prey. The Introduction is interesting, and contains a short sketch of the progress of Ornithology in Britain. The birds are arranged according to the quinary system, and the characters of the genera are illustrated with woodcuts. We are sorry to observe these badly executed. As in the former volumes, the present contains thirty-four coloured engravings. Several plates are devoted to the eggs of the species. This is a new feature in the work, and will most likely be considered an addition to its value. On the whole, the plates are tolerably well executed, although faults both of the engraver and colourer might readily be pointed out.

We wish, in conclusion, every prosperity to Sir William and his *Library*, and doubt not that his *Raptores* will be gladly welcomed by the student of British Ornithology.—R.

The India Review; and Journal of Foreign Science and the Arts. Edited by Frederick Corbyn, Esq. No. xvii., Aug. 15, 1837. Calcutta: *G. Woollaston*, No. 49, Cossitollah.

This number—the only one we have seen—contains several interesting original communications on Natural History, some of which we shall probably extract at an early opportunity. The English Journals are frequently laid under contribution in the work before us.

LITERARY INTELLIGENCE.

Mr. Waterton's *Essays in Natural History* are at length published. If favoured with a copy for review, we hope to give the volume early notice.—Messrs. Longman & Co. announce a work *On the Doctrine of the Deluge*, by the Rev. L. Vernon Harcourt.—Likewise a *Popular Introduction to the Modern Classification of Insects*, by Mr. Westwood. It is intended as a sequel to the entomological work of Kirby and Spence, and will be issued in monthly parts.

OBITUARY.

I regret to announce the death of Jabez Gibson, Esq., banker, Saffron Walden, Essex, Feb. 22, 1838. Although perhaps not known to any of your readers by the prosecution of scientific researches, he was still one who claims the especial

notice of *The Naturalist*, on account of the liberal manner in which, by his purse and influence, he encouraged science, especially Natural History. I believe it is owing chiefly, if not entirely, to his zeal, that the town of Walden is possessed of so many valuable institutions, which alike reflect credit on their founders and those who support them. In connection with the name of Mr. GIBSON I can but introduce to your readers some of the institutions above alluded to, and I do so as the spread and advancement of Natural History has ever been a prominent feature in them. And first of the Agricultural Society, which has now been established four or five years, and is in a very prosperous condition; its success has been beyond the anticipation of its founders, and Agriculture has already been considerably raised in the neighbourhood through its means.* The Horticultural is also a flourishing society, and of much earlier date than the last; by the encouragement it has given to the cultivation of the garden allotments so extensively (and, I believe, originally) adopted in this parish, it has succeeded in giving a new aspect to the poorer population. Both these societies have libraries, in which will be found some of our best works in every department of Natural History. The Society for Mental Improvement is one in which the late Mr. GIBSON took great interest, regularly attending its meetings; taking part in the discussions, and delivering occasionally a lecture to its members. It was after attending one of these meetings that he was attacked with the fatal stroke which so speedily and painfully removed him from the midst of his friends. But the institution which I believe is most indebted to Mr. GIBSON, and which I look upon with the most interest, and consider the highest honour of the town, is its Natural History Society. In connection with this society, by the exertions of five or six individuals, a museum has been formed that would do credit to any town in the kingdom. By the industry of the Curators, and the liberality of Mr. GIBSON, some of the rarest objects in Zoology have been placed there, and the collection especially of British birds and that of British and Foreign insects, is very excellent. I hope soon to be able to furnish your readers with a more full account of the rise and present state of this museum. In the mean time it is to be hoped that the example of Mr. GIBSON will not be lost upon your more wealthy readers, seeing how much it is in their power to promote the diffusion of science, and by this means to increase the happiness and welfare of the great mass of mankind.—E. L.

* This Society, in conjunction with the Entomological Society of London, lately offered a prize for the best essay on the Turnip-fly, as announced by Mr. WESTWOOD, p. 140. The statement of Mr. LANKESTER (p. 106), relative to the amount of the prize, is probably a mistake.—ED.

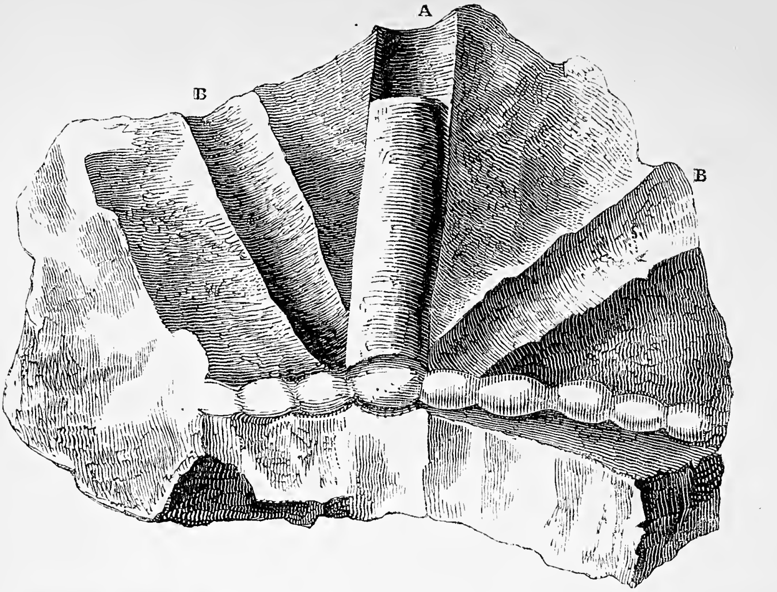


FIG. 2. Tentaculum running through the upright stem of *Alcyonia monilia.*—Casts of branches, apparently proceeding from stem, *a* ; upright stem, *b*, *b*.—Natural size.

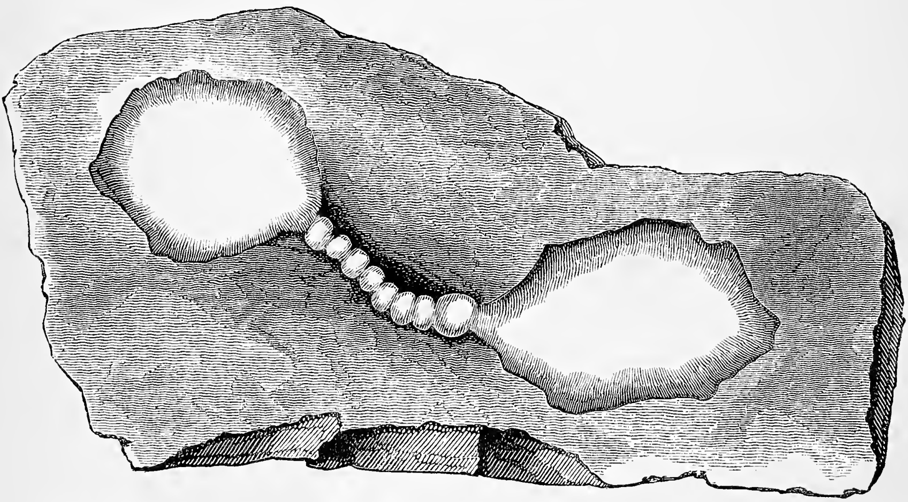


FIG. 3. Two large lobes of *Alcyonia monilia*, connected by a beaded tentaculum. Half the natural size.

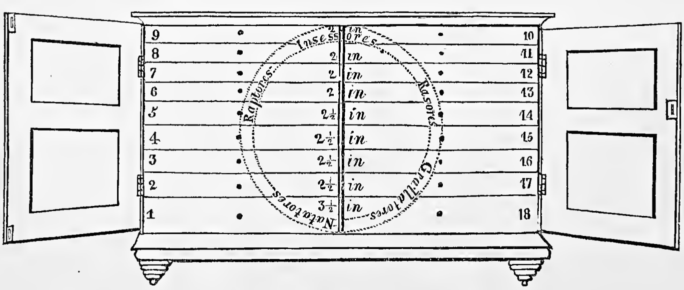


FIG. 4. Oological Cabinet.

No. xxi. *Plate* 2.

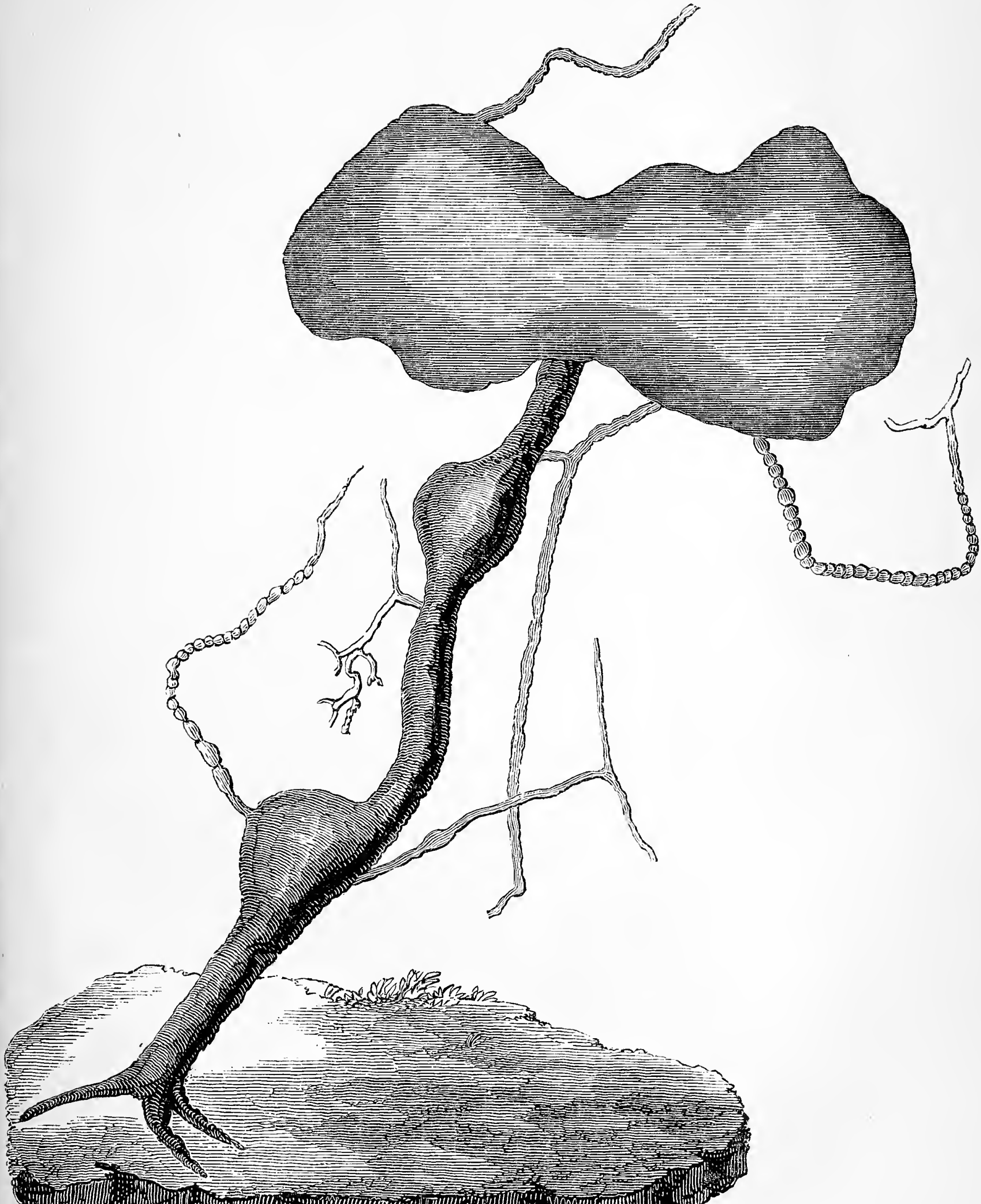


Fig. 1. Restored figure of *Alcyonia monilia*. Half the natural size.

No. xxi. *Plate* 1.

THE NATURALIST.

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A SKETCH OF THE NEW RED SANDSTONE FORMATION.*

By the Rev. Thomas Dwyer, M.A., and George Thompson, Esq.

The New Red Sandstone in its composition consists entirely of the abraded and disintegrated fragments of older rocks, the harder and less worn portions of which abundantly occur as pebbles of larger or smaller size, rarely if ever exceeding in dimensions a diameter of about six inches. The New Red Sandstone strata are generally inclined to the horizon at very small angles, and form hills of but inconsiderable elevation. In these two latter circumstances it is peculiarly and remarkably distinct from all older formations, which are almost always found inclined to the horizon at very high angles, and which attain the greatest elevations about the level of the sea.

In the neighbourhood of Liverpool the dip of the New Red Sandstone varies from about 6 to 7 degrees to from 10 to about 13 degrees; in the peninsula of Wirral the dip is very uniformly about 6 or 7 degrees; on the east side of the river Mersey it varies more considerably, and we think we may say without exception that this dip is always to some point of the compass between N.E. and S.E. At the time the New Red Sandstone was formed, the relative positions of land and water were undoubtedly exceedingly different from what they are now. The whole area of England south of the Cumberland and Westmoreland hills and east of the Welsh mountains, together with an extensive portion of the adjoining continent of Europe, must at this ancient period have been the bed of the ocean; and yet there must at the same time have been great and extensive tracts of land of primary formation above the level of the ocean, to account for the millions upon millions of cubic yards of materials which were then constantly being abraded and worn away from the main land, and embedded in the adjacent seas, to the accumulation of strata of many thousand feet in thickness. Yet we find now no traces of such extensive tracts of land: the only primary formations at present existing in these neighbourhoods are of an isolated character, extremely limited in geographical extent, and incapable of furnishing anything

* These pages are extracted from a paper read at the January meeting of the Liverpool Natural History Society.—Ed.

like an extensive formation. We are therefore driven to the conclusion, that there were at one time extensive tracts of land of primary formation where now is nothing but sea. And it almost seems as if in the lapse of time a nearly total change of sea and land has taken place. If a chief portion of the Continent was once the bed of the sea—of which we think there is undoubted evidence—and if also a chief portion of the continent of North America was once and probably at the same geological era similarly situated, why may there not in the Atlantic Ocean, which now rolls its vast waves uninterruptedly from continent to continent? Why may there not have been large islands and tracts of land with their mountains, hills, vallies, and other phenomena, which have been worn away and destroyed by the powerful action of the elements which then, in all probability, acted with much greater intensity than now? And at the time the present dry land was gradually being raised from below the level of the sea, other portions of the earth's surface may have as gradually been subsiding; of the one we have positive evidence, but of the other we can only have, from the nature of the case, negative evidence.

Immediately prior to the deposition of the New Red Sandstone formation, extensive and sudden changes seem to have taken place with respect to the then relative position of the sea and land. The sea seems to have acted on the land with great turbulence and violence, and the turbid and muddy waters have deposited with considerable rapidity the lower beds of the New Red Sandstone formation. Under circumstances of this kind, where we find the hardest rocks have been ground down into fine debris, there is little or no probability that there would be any preservation of the delicate fabric of organized beings; not but that they may have been fully as abundant then as they were both before and subsequently. The waters seem to have acted with irregular degrees of violence, often coming apparently in floods or flushes, bearing with it a quantity of stones and pebbles, and then depositing upon these latter finer materials, as may be seen most frequently in the strata of the New Red Sandstone, in quarries and other localities, where the lower part of a stratum will be a kind of conglomerate, and the upper part of it a fine-grained Sandstone. Sometimes the water would come with such force as to work up what had already been deposited, and redeposit it, so that we have pebbles of the New Red Sandstone itself, as well as pebbles of the older rocks occurring in its strata. At other times the rock has been deposited so finely that it is laminated in seams almost as thin as the leaves of a book; in this case the pebbles are rare and very small. There would also, no doubt, be partial eddies and currents of water, accompanied with smoothness and stillness, to which may be owing the minute and fine grained appearance of the rock in some places. In many strata of the New Red Sandstone may be traced ripple marks precisely the same as those which are formed

by the sea on our shores at the present day. There are some other facts connected with the New Red Sandstone which are worthy of notice. The extreme rarity of argillaceous materials in the lower beds of the New Red Sandstone formation, and its great abundance in the upper. The lower beds are altogether pebbly or arenaceous, with a few nodules of clay, whereas the upper beds contain strata of clay many feet in thickness, and there seems to be a gradual increase of argillaceous deposit as we rise in the scale of the strata. Many of these strata of Marl appear to have been deposited much thicker than they are now, for the upper surface of them is ridged and furrowed as if strong action of water had passed over them and carried a good deal of their materials away. And this is probably the origin of the great number of nodules of Clay which exist in the New Red Sandstone strata.

All these conditions which have been mentioned serve to shew under what circumstances the New Red Sandstone was deposited, and they also render it little remarkable that traces (for they are but traces) of organized beings are so extremely rare. It is true that some fossils from the New Red Sandstone were exhibited by the Rev. James Yates at the late meeting of the British Association in this town, but these were entirely the fossils of the Coal measures, which were discovered in some of the New Red Sandstone in Worcestershire; and we think it likely, that the circumstances of their being discovered would be either, first, that they were in embedded masses and fragments of the Coal measures which had been torn from the places where they were *in situ*, and so mixed with the pebbles and other ingredients of the New Red Sandstone, which is not at all unlikely, for pebbles from the Coal measures are abundant in some beds of the New Red Sandstone, as we ourselves have seen; or, secondly, that in that part of England the causes which had tended to produce the Coal measures and the Coal measure fossils and plants, had not altogether ceased to act when the causes which produced the New Red Sandstone had come into operation.

NOTES ON THE ORNITHOLOGY OF ST. ANDREWS.

By Henry Buist.

The Dipper, *Cinclus aquaticus*.—This active little bird is by no means common in the immediate neighbourhood of St. Andrews, although it is occasionally noticed on the banks of the Kinnes-burn close to the town. It may, however, be seen in abundance at the Kenlie, a small stream about four miles distant.

The Fieldfare, *Turdus pilaris*.—Visits us regularly every year. In *The Naturalist*, Vol. II., page 326, an instance is recorded of this bird breeding in

Scotland, and I have now much pleasure in recording other two instances. A pair of these birds built their nest here in the summer of 1835, in the cleft of a Beech-tree, about twenty feet from the ground. It was, however, unfortunately destroyed after four eggs had been laid. The nest was very like that of the Garden Ouzel. The other instance is that of a pair which built last summer in a garden in the West of Fife. This nest was built in an Apple-tree, four or five feet from the ground. The female displayed a great degree of boldness when on her nest. She actually allowed herself to be lifted from her nest (which was frequently done), the eggs and nest to be examined, and again replaced, looking all the while as if nothing had happened.

Garden or Common Thrush, *Turdus hortensis*.—Very abundant. They destroy great quantities of almost all kinds of fruit. Strawberries, Gooseberries, Currants, Cherries, Apples and Pears, the berries of the Holly, Alder, and Mountain-ash being greedily devoured by them. They do not spare the berries of the Mountain-ash around the house here so long as they do with you* (*British Song Birds*, page 18), for no sooner are they fully ripe than this bird and the Garden Ouzel commence eating them, and in a short time devour the whole. The favourite site of the Thrush's nest here is in evergreen shrubs, young trees, and hedges; but last year I found a nest containing five eggs in a hole on a grassy bank at the side of a small stream; this must, however, be considered a very uncommon locality for the nest, especially as it was close to a plantation of young trees abounding in the ordinary situations that are selected.

Spring Oatear, *Budytes verna*.—Common. My observations on this bird agree with those of your correspondent Mr. Salmon (Vol. II., page 103), as I have found it at all times frequenting the Kinnes-burn. Some of them remain with us during the winter. I observed a single individual flying about the streets of St. Andrews on the 21st of January this year—one of the most stormy days we had during the winter.

Sky Lark, *Alauda arvensis*.—Very abundant except during the winter months, when great numbers of them leave us for the south. Owing to the great quantity of snow on the ground during the months of January and February this year, the Sky Lark was very late in beginning to sing. The first one I heard singing was on the 4th of March, but on the 5th of the same month (which I may say was the first spring day we had this season—a gentle wind blowing from the west, with bright sunshine) the air resounded the whole day with their song. On the same day the Redbreast, Chaffinch, Yellow and Corn Buntings, and the Hedge Dunnock, were busily engaged with their respective songs. Last year I heard the Lark singing as early as the first of February. I have frequently heard them

* Our remark chiefly holds good in districts where the Mountain-ash is very abundant.—Ed.

singing on the ground, when I think there is a greater variety of notes than when soaring in the air; but this may be in consequence of their notes being more distinctly heard.

Corn Bunting, *Emberiza miliaria.*—Very common here at all seasons, although not quite so abundant in winter as at other times. During the spring and summer it may be seen perched on the most prominent twig of a hedge or bush, or as frequently on the top of any strong weed (such as the Common Dock) in the Corn-fields that may be higher than the Corn. There seated, he goes over his song, if song it may be called. He is not, however, easily disturbed, for he will generally allow you to be close upon him before he flies off, and he seldom flies far if there is any prominent twig near, on which he alights, and again resumes his song.

Yellow Bunting, *Emberiza citrinella.*—This beautiful Bunting is very plentiful in this district, and may be seen in abundance at all seasons. During the winter they generally fly in large flocks along with the Chaffinch, Whin Linnet, and Green Grosbeak. In the *British Song Birds*, page 195, it is stated that its song is first heard in April. This is evidently a mistake,* as I heard it singing this year (in which all the birds have been late in commencing to sing) on the 3rd of March, and you mention in *The Naturalist*, Vol. II., page 54, having heard it last year on the 13th of February. The most common situation for its nest here is the sides of ditches, the bottoms of hedges, and Whin-bushes, but I have also frequently found it in Strawberry-rows.

Chaffinch, *Fringilla cœlebs.*—This pretty little bird is very common here at all seasons. It is stated in the *British Song Birds*, page 350, that the nest "is rarely met with in hedges of any kind."† This is by no means a rare occurrence here, for I find every year a great many of their nests in a hedge (composed of Beech, Hawthorn, Privet, and Holly) surrounding the garden. The nest in this hedge is most frequently built on the Beech. I have frequently found it on Hawthorn hedges. It often builds on the Alder and Apple trees; I have seen its nest on a wall fruit-tree, and once found one between fifteen and twenty feet from the ground, on a large Beech-tree, close to the main stem.

Goldfinch, *Carduelis elegans.*—Not a common bird here, but may occasionally be seen. A few of them remain with us during the winter, when they may be seen in pairs flying about the heads of withered Thistles, picking the seeds that may still remain in them.

* Like many other of our native songsters it resumes its notes with the first indications of a return of spring weather; and, like them, frequently again becomes mute in case of a relapse of rude north or east winds. The regular setting-in of its song for the season therefore depends mainly upon the weather.—Ed.

† We have found it in hedges, but certainly not commonly.—Ed.

Ivy Wren, *Anorthura troglodytes.*—Very abundant. Its song is very similar to that of the Redbreast, but more shrill and lively. A pair of these interesting little birds build annually among the Raspberry-bushes in the garden. We have also every year two or three of their nests built of withered Beech-leaves in the Juniper and other bushes, which however are never inhabited. I have always observed the nest to be lined with feathers. In one of the many severe days which we have had during the past winter, I saw five or six of these little birds in the afternoon creep into a Swallow's nest built on the house here, where they would probably remain during the night, protected from the stormy blasts.

Kingfisher, *Alcedo ispida.*—A single specimen of this splendid little bird (the only one that I know of having been seen in this neighbourhood) was shot on the Kinnes-burn (see p. 43) about half a mile from St. Andrews, in the spring of 1834. The specimen, which was stuffed, is still in the possession of the person who shot it.

Ring Pigeon, *Columba palumbus.*—Very common. During the late storm, when the ground was covered with snow, immense flocks of this Pigeon visited the gardens here, and made great havoc among the vegetables which were above the snow, and the leaves of which they devoured. But when the snow began to melt they betook themselves to the Turnip-fields, where they were equally, if not more destructive, as they not only devoured the leaves but hollowed-out the sides of many of the Turnips also.*

Peewit Lapwing, *Vanellus cristatus.*—Abundant during the summer months. I first observed it here last year on the 27th of March, on which day there was a considerable fall of snow, and it took its departure about the beginning of November. This year I saw one on the 12th of February, when the ground was covered with snow, and on the 5th, 8th, and 12th of this month I saw flocks of them flying north.

Chimney Swallow, *Hirundo rustica.*—I first observed the Swallows here in 1836 on the 25th of April, and last year they were three days later in making their appearance, namely, on the 28th of April. On the 30th of September last year I observed them congregating in great numbers, as if preparing to take their departure for a warmer clime. I did not see them after that day.

Corn Crake, *Crex pratensis.*—Heard the cry of this bird for the first time in 1836 on the 16th of May. I however heard him some days sooner last year, namely, on the 13th of May.

Hooper Swan, *Cygnus ferus.*—Several flocks of this large and magnificent bird were seen passing over the river Eden during the late storm. One particularly numerous flock was observed very close on shore and near the ground, about

* Is our correspondent certain of this? If so, the fact is new to us.—Ed.

three miles from St. Andrews. These magnificent birds have occasionally been shot on the Eden, but are, comparatively speaking, unless in cases of severe and long-continued storms, strangers to our shores.

Common Teal, *Anas crecca.*—A great many specimens of this beautiful bird have been shot during the past winter.

Northern Diver, *Colymbus glacialis.*—A beautiful specimen of this large bird was caught alive a few years ago at the mouth of the river Eden. The specimen was preserved by, and is now in possession of, a gentleman residing in St. Andrews.

Law Park Cottage, near St. Andrews,
March 12, 1838.

OBSERVATIONS ON THE POPULARITY OF NATURAL HISTORY.

No. II. With Illustrations and Suggestions.

By Edwin Lees, F.L.S.

(Continued from page 123.)

I wish to be distinctly understood as not taking up a position inimical to the scientific naturalist—whose interests I shall be enabled to touch upon hereafter—but as inquiring into plain matters of facts. If any assertions I make are incorrect they can be easily disproved, and my inferences and conclusions are of course thrown down in the open arena of opinion. I desire, therefore, to bring the subject to the test of reflection, as some suggestions may possibly arise in the course of the inquiry, productive of service to the *extension* of the study of Natural History, which I confess I ardently desire, rather than to blockade its avenues of approach with a still more dense array of terminological boulders than already barricade its confines.

I have already shown the confusion of ideas generally entertained with regard to the alleged "popularity of Natural History," while the fact really is, that though the *objects* embraced by the pursuit are in themselves of general interest, and, when described or alluded to in non-technical language, "popular" in the common acceptation of the term, yet their *scientific study* is by no means so general as to warrant the application of the term in question to it. The idea seems to have arisen from the fact, which has often excited attention, that persons in the very lowest grades of society and in the most dependent situations have been found employing the little leisure the laborious avocations assigned them by poverty allowed, in making collections of insects, or from some half dozen broken pots or smoke-environed narrow strip of ground raising for the horticultural exhibition "the glorious flower which bore the palm away." The

weavers of Lancashire and Norfolk, the glovers of Worcester, and the mechanics of Birmingham—not to mention numerous other localities—have been long noted for cultivating these predilections, and CRABBE, in his well-known "Borough," has made his "friend the Weaver," familiar to every body. This circumstance, however, only entrenches me the firmer in my position that, while the *objects* embraced by Natural History command almost universal attention, their detailed anatomy, as materials for *scientific study*, is scarcely at all attended to, few out of the thousands among artizans who have reared flowers for display, or collected insects for amusement or sale, having really benefited science or the world by any remarks upon the manners, habits, economy or arrangement of the tribes whose beauty or diversities of structure have commanded their attention. No doubt this arises on the one hand from the absence of competent guides, the deficiency or expense of books to consult, and on the other from the pursuit being taken up merely as the amusement of the hour, with the same zest that others would seize upon the bowl or the quoit—

"Whether the call-bird yield the hour's delight,
Or, magnified in microscope, the mite;
Or whether tumblers, croppers, carriers seize
The gentle mind, they rule it and they please."——CRABBE.

But the disadvantage of engaging the acquaintance of Natural History on such a principle as this is (however praiseworthy in itself) that as it acts unfettered by the terms of science, so it is compelled to invent a vernacular dialect still more barbarous and absurd than the pedantic names often foisted upon objects, apparently with the charitable view of choaking the neophytes who may be compelled to pronounce the cabalistic words. And independently of the absurdity of imposing such names as "Grim the Collier," "Lancashire hero," &c., upon plants or their products, and finding "Purple Emperors," "Queens of Spain," "Red Admirals," and Elephants, Tigers, Leopards, Magpies, &c., among insects, a feeling of rivalry often amounting to malignity is engendered between exhibitors and collectors, entirely marring all the delightful and amiable feelings one might have expected to arise from the contemplation of some of Nature's fairest works, and leading to bitter disputes, heart-burning detraction, and deception and narrow selfishness absolutely degrading. All this true science and correct feeling disclaims, but it is fully demonstrable therefrom that it is a very different thing to cultivate a few plants in pots, make an arrangement of pictured wings, or tap a tame Squirrel on the head, and from actual knowledge and study be competent to rank with the botanists, entomologists, and zoologists who have devoted their lives to the pursuit. It follows that the objects comprised in any study may charm superficial notice without the study itself being generally attended to, or at all philosophically considered—just as a set of clowns in an autumnal

evening, may gaze upon the Aurora Borealis delighted with the "merry dancers," and retire without a single reflection arising in their minds as to the cause of the phenomenon, beyond the superstitious remembrance that some grandmother of the village had recollected to have seen a similar display before poor Tom Stiles was killed at the Battle of Bunker's Hill.

Having already pointed out those descriptions of natural objects which, from their fidelity and beauty, and their smell of earth and air, are at once recognized by all, I must allude to those symbolical references to the works of Nature which have been used by all nations and in all countries, more especially where pastoral or venatorial habits have not, from the rapid advance of population, fallen into disuse. These are similes taken from natural objects which are supposed to accord with the narration of the writer or speaker, and to illustrate his meaning more fully, or at all events, by the introduction of pleasing imagery, to offer an episodic pause in or contrast with the subject treated upon. They are so commonly applied, though perhaps not always properly, that any one who looks for illustrations in authors, may find them thick as fallen leaves in autumn. It may not be amiss, however, to classify them into—

I. References to the aspect of Nature generally.
II. Similes drawn from particular animals or objects.
III. Sentimental or moral deductions.

In illustration of these I must of course make a few quotations, as it is of importance to bear in mind, that such images would never have been referred to had not their familiarity and truth rendered them obvious to all who heard them. I shall take instances from both Homer and Virgil, though, for the sake of the general reader, the garb of translation will be sufficient here.

A Snow Storm.

"Their ardour kindles all the Grecian pow'rs;
And now the stones descend in heavier show'rs.
As when high Jove his sharp artillery forms,
And opes his cloudy magazine of storms;
In winter's bleak uncomfortable reign
A snowy inundation hides the plain,
He stills the winds, and bids the skies to sleep,
Then pours the silent tempest thick and deep;
And first the mountain tops are covered o'er,
Then the green fields, and then the sandy shore;
Bent with the weight the nodding woods are seen,
And one bright waste hides all the works of men." Pope's *Homer*.

A snow-storm of this description, unattended with wind, it would be impossible for the most ardent lover of Nature better to describe; though, critically speak-

ing, it scarcely answers the purpose intended, as showers of stones from hostile armies, however thick they might fill the air, were not intended, and could scarcely be expected, to fall quite so soft as snow. The following is very beautiful, as displaying not the still life of the snow-storm, but the husbandmen running about in all directions for shelter from the hail, and as they all contrive to crouch somewhere, the image is perfect in reference to ÆNEAS, whom the writer has in view, as the hero sustains safely the entire galling efforts of his adversaries, and tires them out :—

HAIL STORM.

" As when the clouds in battering hail rush down,
The lab'ring hinds fly diverse o'er the fields.
And ev'ry swain; while couch'd beneath a bank
Or high projecting crag, the traveller lurks,
Till the rude fury of the blast be o'er,
And the bright sunbeams bless again the day.
Just so ÆNEAS, overwhelm'd by foes,
Sustains their onset." VIRG. *Æn.*, x., 803—10.

Pictures of this description are not limited to time, age, or country; they speak a universal language, and are worth a hundred books of blood and slaughter. The following passing look at the lightning is admirable, short as it is, and could scarcely have been struck off so exactly but by the hand of a SHAKSPEARE :—

LIGHTNING IN A DARK NIGHT.

" Brief as the lightning in the collied night,
That in a spleen, unfolds both heav'n and earth;
And, ere a man hath power to say—*Behold!*
The jaws of darkness do devour it up:
So quick bright things come to confusion." SHAK. *Mids. Night's Dream.*

Similes drawn from particular objects in Nature, or from the habits of well-known animals, have a peculiar charm, because in fact the reference, if correct, is characteristic of the animal, or descriptive of the object mentioned, and as in such a case a colloquial name is sufficiently identifying, a scrap of Natural History is in fact served-up almost before the reader is aware of it. If the simile be just, it marks the author's powers of observation, and the pursuits of the inhabitants of the country, too, where he is writing: VIRGIL, one may be sure, had chased a Wolf before he penned the following graphic sketch of the prowling caitiff:—

" So ere the hostile darts beset his way,
Conscious of crime, the Wolf forsakes his prey,
Bullock or shepherd villainously slain,
And by neglected coverts, from the plain

Hath reached the lofty mountains; *still he cowers,*
Hiding his slunken tail as to the woods he scours."

VIRG. *Æn.*, xi, 809—13.

Not to be too diffuse on this head, I shall merely subjoin a few more specimens taken at random from authors which appear apposite to me, though of course, as recollection serves, hosts of others may occur to the reader.

A WARRIOR COMPARED TO A BEAR.

" Or as a Bear, encompass'd round with Dogs;
Who having pinch'd a few, and made them cry,
The rest stand all aloof, and bark at him." SHAKSPEARE.

OWL AND MOUSE.

" And as an Owl that in a barn
Sees a Mouse creeping in the corn,
Sits still, and shuts his round blue eyes,
As if he slept, until he spies
The little beast within his reach,
Then starts and seizes on the wretch ;
So from his couch the knight did start
To seize upon the widow's heart." BUTLER'S *Hudibras.*

IN THE GRASP OF A FOE.

" Nought booted it the paynim then to strive:
For *as a Bittern in the Eagle's clawe,*
That may not hope by flight to 'scape alive,
Still waytes for death with dread and trembling aw:
So he now, subject to the victor's law,
Did not once move, nor upward cast his eye." SPENSER.

PERSEVERANCE OF FLIES.

" Or as a swarm of Flies in vintage time,
About the wine-press where sweet must is pour'd,
Beat off, returns as oft with humming sound." MILTON.

A SLY OLD FOX.

" As when a gaunt and hungry Fox is found,
Entrapp'd alive in some rich hunter's ground;
Fed for the field, although each day's a feast,
Fatten you may, but *never tame* the beast ;
A house protects him, savoury viands sustain,
But loose his neck, and off he goes again;
So stole our vagrant, from his warm retreat
To rove a prowler, and be deemed a cheat." CRABBE.

Old Hawthorn.

"The Hawthorn I will pu', wi' its locks o' siller grey,
Where *like an aged man* it stands at break o' day." Burns.

The beauty of these descriptions is apparent, though made by authors who never professed to be naturalists, and as their truth is obvious, they cannot be the worse for being in a poetical dress, though many persons abhor the introduction of poetry, however true to life, though the images here embodied would remain the same were the words composing them reduced to the plainest prose imaginable. However, it must be evident that such notices of the habits of animals and representations of familiar objects *please the general taste*, or they would not occur in the profusion they do in works not professing to describe objects of Natural History particularly, or be valued as gems when they occur, as they undoubtedly are.

But pictures of Nature and images of natural objects are most frequently made use of by poets and allegorical writers, for the sake of the sentiment connected with or founded upon them; and here ingenuity and invention have ample room to dilate themselves. The deduction from the pictorial image may be forced or natural, and agreeably described, it cannot fail to charm, while the inferences skilfully managed may lead to the most sublime views, or be conducted so as to call up a rich treasury of moral or religious thought, and they often give rise to reflections the poignancy of which pierces to the innermost recesses of the soul. A few instances of this kind of imagery must here suffice, though the subject is not easily exhausted.

On a Wild Nosegay.—Clare.

"The yellow Lambtoe I have often got,
Sweet creeping o'er the banks in summer time,
And Totter-grass in many a trembling knot;
And robb'd the Mole-hill of its bed of Thyme:
And oft with anxious feelings would I climb
The waving Willow-row, a stick to trim
To reach the Water-lily's tempting flower
That on the surface of the pool did swim:
I've stretch'd, and tried vain schemes for many an hour;
And scrambled up the Hawthorn's prickly bower,
For ramping Woodbines and blue Bitter-sweet.
Still summer blooms, these flowers appear again;
But ah! the question 's useless to repeat,
When will the feeling come I witness'd then?"

Thorns no annoyance.

"The untutored bird may found, and so construct,
And with such soft materials line her nest,

Fix'd in the centre of a prickly brake,
That the thorns wound her not, they only guard.
Powers not unjustly liken'd to those gifts
Of happy instinct, which the woodland bird
Shares with her species, Nature's grace sometimes
Upon the individual doth confer,
Among her higher creatures born and trained
To use of reason. ———————
* * * * * * * *
Blest with a kindly faculty to blunt
The edge of adverse circumstance, and turn
Into their contraries the petty plagues
And hindrances with which they stand beset." WORDSWORTH.

I have now shown, in its various phases, that reference to the objects of Nature which is acceptable to all persons of common reading and education; and as it makes no pretence to any thing that may not from observation be accessible to any one, so it is, correctly speaking, popular. I have next shortly to consider Natural History when assuming a scientific form.

Scientific Natural History comprehends the classification of the whole of animate and inanimate Nature, and the necessary attendant terminology. Hence of course, the student, if he intends to become a practised naturalist, has an ordeal of study to pass through which no ingenuity or tact of observation can enable him to dispense with. I must here refer to the very appropriate and valuable observations of Mr. SWAINSON, in Part iv. of his *Geography and Classification of Animals*, in the *Cabinet Cyclopædia*, which every young naturalist would do well to reflect upon.

But the tenour of my discourse has little reference to the regular student, who, consigned to the hands of the professor, will doubtless in due time possess acquirements to observe and classify for himself, or at least to choose out of the numerous systems that demand his attention. I am anxious to consider the interests of those who are not *professionally* devoted to the study of Nature; but who, as amateurs or collectors, wish to enjoy the charms of their favourite pursuit as much as possible. These form a considerable class, and as they are the readers and purchasers of works on Natural History, every effort should be made to increase their numbers, and supply their wants. Many persons have but a limited time that they can devote to the pursuit they love; they naturally wish to give the greatest part of this time to the woods and fields, and when they attempt to study their acquisitions in detail, and to obtain a scientific name for them, they too often find the systematist has prepared such a puzzle for them, that they abandon the attempt in despair, and feel inclined to indulge the idea that "ponderous tomes of cramp technicalities" deserve no attention.

At the present moment excessive analysis has so cut up every department of

Natural History, that, to become a perfect adept in any single division, demands the untiring study of a life, and, however anxious an observer may be to master the difficulties around him, they become at last almost insuperable. The number who from ability or inclination can devote their whole time to any study, must always be very limited, because ardour and enthusiasm, however active, must of necessity have bounds prescribed them by duty. Consequently authors, instead of perpetually coining new terms, and throwing confusion and uncertainty around them, should not forget to have the interests of those in view who, anxious for knowledge, are yet utterly unable, from want of time, to follow the professor into all the labyrinths his minute investigations may have led him.

The result is obvious: empirical knowledge must be seized, as the enquirer finds no other path open before him, and a disgust for technical nomenclature is engendered, which it may be afterwards difficult to get rid of. "To discover the name of a species, is the ultimate object which all amateurs," says Mr. SWAINSON, "and many professed naturalists have in view.* To do this by merely turning over the plates of a zoological work is manifestly *a short and easy road* to knowledge; but the superficial acquaintance thus obtained, however convenient and useful upon many occasions, will not satisfy the true naturalist."† It is remarkable that almost every "true naturalist" inveighs against this "short and easy road to knowledge," as if there was something almost criminal in recognizing a bird by its figure in a good plate, and an insect or plant by an accurate coloured representation. I never could perceive the wisdom of this deprecation, for a figure often gives information where language is found quite inadequate. Some naturalists affect to think that to ascertain the name of any object is quite a secondary thing, but it is really the first step, and nothing can be done satisfactorily without it. A novice might justly think light of an observer of whom he demanded the name of a plant or insect, if he could only answer in general terms that it belonged to some particular group, but what species it was he could not say. Yet Mr. SWAINSON admits that, "in the present paucity of good elementary books," if a young inquirer into Entomology "succeeds so far as to ascertain the *genus* of his insect, he may consider himself very fortunate." With such

* This is not quite correct, but it must be obvious, that until the name of an object be made out, no information can be given respecting it, and a perplexing dubiousness rests upon the mind. Many naturalists seem strongly to object to the name of a species being discovered by the student in an "easy way," as if a person was not more likely to pay attention to the minutiæ of an object whose name he was certain of, rather than to direct his attention to what he was entirely unacquainted with. How often in the works of non-scientific travellers one has to lament that they could not tell us the names of objects they saw, instead of a mysterious and tantalizing statement as to quadrupeds, birds, plants, &c., the species of which want of knowledge rendered them unable to determine, and which their imperfect descriptions will not permit us to unravel.

† SWAINSON'S *Geog. and Classific. of Animals*, p. 353.

hindrances in the way, such obstacles, and such uncertainties, who can wonder that so few venture into the intricacies of Entomology, though more than ten thousand British insects have been named? Doubtless, were aids to study more numerous and accessible, there would be a considerable increase of entomologists.

Into every other department I need not enter, nor will space allow; all have not the same difficulties around them, and yet the zoologist may perceive, each in his own province, some bar or obstacle obstructing progress, which it would be no disadvantage to remove. The multiplication of new terms without explanation is a perpetual source of annoyance and disquietude in scientific works, which thus, instead of forwarding the student, keep him oscillating to and fro to no useful purpose. As an instance I may take Mr. T. B. HALL's complaint in the present volume of *The Naturalist* (p. 88), where he says he is "quite at a stand-still," for want of a glossary to the terms employed in the two last volumes of HOOKER's *British Flora*. Mr. LANKESTER, at p. 177 of *The Naturalist*, in his paper on the "Linnæan and Natural Arrangements of Plants," admits, I perceive, that many of the books of Linnæan botanists "are written in a pleasing style, and are calculated to *allure* to the study of Botany;"—then why object to them with this obvious utility about them, and the following ominous confession:—"If there have been any deficiency of books on the natural system, it has been for the *want of demand*." Just so. If works are written adapted only for the studious few, however learned the author, the demand must be limited. If the author, not satisfied with his own claims, captiously assails other systems that have enjoyed a deserved popularity, he must expect opposition, for those who have found the utility of their own course of study will hardly abandon it at a first summons, at the *ipse dixit* of those who are interested in its suppression.

There are two parties to be addressed by writers on Natural History; the first are professional students, or those whose leisure and resources enable them to dedicate their chief time to their favourite subject; and the second are those whose pleasure is in the "poetry of Natural History," and whose intervals of relaxation from commerce or professional duty enable them only to glance with rapidity upon the condiments presented to their view. These are thus alluded to by Professor HENSLOW:—"All who feel an unaccountable delight in contemplating the works of Nature, who admire the exquisite symmetry of crystals, plants, and animals; and who love to meditate upon the wonderful order and regularity with which they are distributed; [these] possess a source of continued enjoyment within themselves, which is capable of producing a most beneficial effect upon their temper and disposition, provided they do not abuse these advantages by making such studies *too exclusively* the objects of their thoughts and care."* In advocating the claims of this numerous class, I am only con-

* *Principles of Descriptive and Physiological Botany*, 12mo., p. 4.

tending for the more effectual spread of a taste for Natural History. The thing itself is inherent in every human breast. "Almost every one," says Mr. Swainson, in the work I have before quoted, "having the least taste for Natural History, will peruse with pleasure a well-written account of an animal whose habits and manners, and modes of living are not generally known, although they may have no idea of studying Natural History as a science." But scientific Natural History might easily be simplified and rendered more intelligible to all, if its professors were less intent upon building systems and discussing wire-drawn points, which pass away into obscurity with the current that drew them forth. I object not to the learned labours of the closet naturalist, but they cannot be sufficiently appreciated if he disregards the humble efforts and toils of those who labour in the fields to muster up stores which may eventually prove of considerable utility. Let the systematist aim to attract the popular observer to his cell, and he will find his efforts not thrown away in the additional zeal which will animate the former when he finds the utility of scientific language.

Museums in every principal city, if *properly arranged*, and their specimens *correctly named*, may become great auxiliaries in the cause of science, and facilitate study greatly to those who may be unable to purchase very expensive books. For I must again observe, that if knowledge be gained, it can be of little moment whether it be due to the pencil, the graver, or the labelled subject in the cabinet or museum. There is no talismanic power in technical language—on the contrary, its inadequacy and obscurity often leaves the inquirer in a cloud of doubt, and whenever that doubt can be removed, I see no reason why "easy" facilities for the acquisition of knowledge should not be made available. But at any rate, if Natural History is to become truly *popular*, it must not rest like a mere stuffed figure—a thing without life or motion, made up of uncouth words, and offering only a charm to the anatomist—it must speak in language that all may understand, and present a sacrifice at which all may assist.

The dignity of science is considered by many to be sacrificed by any attempt to soften its asperities, and ornament and imagery are thought inconsistent with the plain facts and stern deductions of research and inquiry. In some instances this may be correct. But the field of Natural History is placed before Man as a charm to diversify the bitter endurances that ever throw their shadows upon human life and action. As presented by the Deity it is all enchanting, and Man only arrays it in a respulsive dress. Let us try to keep it still in its simplicity and purity, with at least some vestiges of life and loveliness—let not all be transformed into dry bones. I desire the popularity of Natural History in its fullest extent, and for this reason I urge upon authors the display of its beauties in their most attractive dress.

But then, it is said, we shall only have a race of superficial naturalists who

will add nothing to our knowledge, and leave the depths of science wholly unexplored. This, however, is a false idea. The individual who enters upon a pursuit only as an amusement, and is charmed with it, is more likely to proceed to higher attainments, than one who began as a crabbed student, and, looking with averted eye upon his task, becomes at last disgusted with his abortive efforts.* It by no means follows that, because a Linnæan botanist does not choose to follow a LINDLEY in all his admirable details of structure, he undervalues those labours; nor can I think that an ornithologist who may not have time or ability to examine and classify with the minuteness of a TEMMINCK or a SWAINSON, would at all despise the exertions of those learned systematists. For if all were instructors, where would be the audience? Why, then, should the endeavours of popular writers be sneered at by systematists as unworthy attention? Why should this "easy way" to knowledge be attempted to be put down? There is an old proverb, that, *let pleasure be the motive*, and no toil will be thought severe—and so if science only first tempt her votary into the path of enjoyment, no thorns or obstructions will afterwards prevent the upward progress of the neophyte.

In ascending a mountain, I have frequently noticed young aspirants despise the easy winding way, and scale the steepest ascent, laughing at the timidity of their friends. But they seldom gained any thing thereby. Their companions, beguiling the way by observation and remark, reached the top almost without experiencing fatigue, while the undaunted scalers of the precipices, panting and tired, had but just out-stripped their friends, who had enjoyed an excursion which the former had converted into a trial of skill only to harass and distress themselves, without any concomitant benefit. And so in science, those who take the roughest track, and would fain think nothing of those who may prefer an easier path, may after all meet on the same height those who with humbler appliances had yet, by determined perseverance, continued looking upward, and marching on in the same direction.

Dryadville Cottage, near Worcester,
April 20, 1838.

* This is an excellent remark, and one of practical importance.—ED.

ACCOUNT OF A FOSSIL ZOOPHYTE, *Alcyonia monilia*, DISCOVERED IN THE LOWER GREEN SAND OF THE IGUANODON QUARRY, MAIDSTONE, KENT.

By Mr. W. H. Bensted.

Few objects are more perplexing to the naturalist than those which compose the numerous and protean class of zoophytes—creatures which appear to form a connecting link between the animal and vegetable kingdoms. The difficulty of determining the character, construction, habits, and economy of even recent species, is so considerable as to demand an accuracy of observation which belongs to few, and an intimacy of acquaintance not easily attainable. What, for instance, can be more puzzling than the changes observable in the *Actinea*, or Sea-marigold, whose external form is so repeatedly changing that it presents in succession the several appearances of an amorphous mass of jelly, a flower, and an open Oyster?

But when our investigations are confined to fossil specimens—the forms of which are stereotyped and unalterable, and whose relics occur only in detached portions—this difficulty is increased a hundred fold. And even when the remains are abundant and well preserved, although a tolerably correct idea may be formed of the ordinary figure of the original, it is still difficult to trace it through all its metamorphoses, or to identify it under the varied appearances it presents. A familiar example of this fact may be found in the ventriculites of the chalk formation, so well described by Dr. Mantell in his *Geology of the S.E. Coast of England*. The specimens enveloped in flint are usually funnel-shaped; but those occurring in "every intermediate form between that of a simple elongated cone, and a flat circular disk," are evidently congenerous. In a similar manner we shall find the family of *Alcyonia*—which are nearly allied to both the species of *Polypi* referred to—differing much in form and external character. The new species which I am about to describe, has been named *Alcyonia monilia*, and abounds in the Rag-stone, Shanklin, or lower Green-sand formation of the district in which I reside; a brief geological sketch of which will serve to introduce my remarks upon it.

The neighbourhood of Maidstone has much to interest the geologist. The Chalk, which lies uppermost, may be explored in the pits, situate within a morning's walk from the town, which afford many specimens of great rarity.

The Gault or Folkstone Marl immediately below it, is cut through by the Medway, and presents a fine opportunity to the student for collecting specimens.

Beneath this occur extensive beds of Rag-stone, in which are faults of considerable extent, filled with beds of Red Loam, or Brick Earth, containing

remains of the Elephant, Rhinoceros, Horse, and Deer, and fragments of several bones of other Mammalia.

This Rag-stone bassetts out above the Weald Clay, about four miles to the south-east of the town, and thus a great variety of formations may be visited with great ease and convenience, offering such facilities for geological research as are not often to be met with.

Alcyonia monilia (Plate 1, Fig. 1) is furnished with a cylindrical stem, attached by ramose fibres to the sands on which it grew. It has several lobes upon the stem, at irregular distances, and generally terminates in an expanded head, often of considerable size, and in shape resembling the Flint-nodules of the Chalk. The stem and lobes have a rough uneven surface, covered with papillæ. A spinous or tuberous structure has been detected in but few specimens. The peculiarity of this zoophyte consists in the beaded tentacula, proceeding from the stem, lobes, and head, which are sometimes attenuated into cylindrical threads. From their great variety of shape and size, they had probably considerable powers of extension and contraction. The large expanded head contains, in some instances, part of the stem, lobes, and beaded tentacula, folded within it, and I conjecture, that in some specimens the whole economy of the zoophyte is withdrawn within it, in a similar manner to that of the recent *Actineæ*. In such cases, the specimens appear externally like variously-shaped nodules, but on being broken, the tentacula, stem, and lobes may sometimes be seen within.

This zoophyte is evidently analogous to the *Polypi*, discovered by Mr. Webster, in the Green-sand of the Isle-of-Wight, and closely assimilates with the *Polypothecia* from the neighbourhood of Warminster, described by Miss Bennett; but Mr. Webster mentions only the simple lobated specimens "in which from two to five or six lobes, closely united together, are found."

This is the common appearance, and it is only by a large assortment of specimens that the varieties of shape and figure, described above, can be connected so as to justify the conclusion that all belong to the same class. Mr. Webster, who inspected some specimens in my collection, instantly recognized the similarity of the simple lobated stem with the Isle-of-Wight zoophyte, but the tentaculum, he said, was a new discovery, and expressed much interest in it, particularly in the folding of the lobes, stem, &c., in the superior head.

I find them principally in the upper strata of the Rag-stone, which is arranged in alternate layers of arenaceous Lime-stone and a siliceous coarse Sand; the fossil occurs in various shapes and states of preservation, depending on the stratum in which it is imbedded. The Lime-stone contains the most clearly-defined specimens, as the stem is seldom well preserved in the Sand, although the large heads are frequently procured from it by their possessing a great portion

of Silex, and being consequently harder than the surrounding beds. The surface of these heads is always smooth and round, probably from their distended state; and presents a strong contrast to the stem and lobes, which are studded with papillæ.

The layers of stone are from ten inches to two feet in thickness, and frequently the stem in the stratum of hard Limestone finishes in the layer of Sand next above. It is impossible to get a complete specimen, as the zoophyte is so closely blended with the stone; four lobes upon one stem is the most I have yet seen.

I am not certain that it should be classed as an *Alcyonium*. Dr. MANTELL favoured me with his opinion upon some specimens which I sent to him in 1835, which was that, "in all probability, the fossil belongs to different genera of zoophytes allied to the Sponges and *Alcyonia*, but differing from both."

The accompanying drawings will, I trust, assist in conveying a tolerable conception of the originals. Fig. 2 (Plate 2) is a remarkable specimen, with the beaded tentaculum running through the stem, and with a correct representation of the stone which contains it.

Fig. 3 represents two large lobes connected by the beaded tentaculum; the stem of this specimen is not clearly defined, as the mass of stone is not broken in the part through which it runs.

Since my discovery of the unique specimen of the *Iguanodon*,* I have paid great attention to the collection of other specimens from the same quarry, and have been successful in procuring some particularly interesting. The vegetable remains are very abundant, consisting of fragments of stems of coniferous trees, sometimes much water-worn, and filled with *Teredines*. I have a beautiful cone of a species of Fir—exceedingly delicate, but very perfect; at present I cannot decide on several which I conjecture to be fruits. I have a fine tooth of the gigantic *Plesiosaurus*, and one of a Crocodile, the surface of each being striated. Three mandibles of the *Chimæra* have been procured, with vertebræ of fish, and numerous teeth of *Squalus*.

Maidstone, *April* 23, 1838.

* MANTELL'S *Wonders of Geology*, Vol. I., p. 358.

ON THE HABITS AND PECULIARITIES OF BRITISH PLANTS, AND ON THE DERIVATIONS OF THEIR LATIN NAMES.

By T. B. Hall.

(Continued from p. 186.)

Alnus.—From *al*, near, and *lan*, edge of a river, Celt., on account of its habitat.

Alnus glutinosa, Common Alder, Owler, Scotch Eller.—The Alder flourishes best in low marshy situations, in which it is frequently planted to make hedges. It will not live in a chalky soil. It is easily propagated by seeds, but not by slips or cuttings. Grass grows well beneath its shade. The wood is soft and brittle; endures a long time under water, and therefore is used for pipes and piles, and to lay under the foundations of buildings situated upon bogs. According to Vitruvius, the ancients were well acquainted with the imperishable nature of this timber, when used for piles in swamps or under water; in such situations it becomes black as ebony, and almost as hard as iron. The Rialto of Venice is thus founded; nor has its use been neglected in the Netherlands. The branches may be cut for poles every five or six years. Women's shoe-heels, ploughmen's clogs, cogs for mill-wrights, various articles of the turner, and in the Highlands handsome chairs, are made of it. The bark yields a red colour, and, with the addition of copperas, a black. It is also used to dye brown, particularly thread. It is principally used by fishermen to stain their nets. The country people in Scotland often make their own shoes; and, following the example of their forefathers, to avoid the tax upon leather, privately tan hides with the bark of Birch and Alder. Various passages in the ancient classics seem to intimate that the trunks of Alder-trees were among the first converted into boats. Martyn ingeniously surmises that one of these trees, hollowed by age, might have fallen into the water, and so given the first idea of navigation. In the Highlands of Scotland, near Dundonald, says Pennant, the boughs cut in the summer, spread over the fields, and left during the winter to rot, are found to answer as a manure. In March the ground is cleared of the undecayed parts, and then ploughed. The fresh-gathered leaves are covered with a glutinous liquor, which concretes into a spurious manna. They are sometimes strewed upon floors to destroy Fleas, which are said to be entangled in the tenaceous fluid, as birds are by birdlime. The catkins dye green. The whole plant is astringent. It affords food to many kinds of Moths and other insects, as *Orchestes Alni*, *Psylla Alni*, *Adimonia Alni*, *Livia Alni*, and *Tenthredo luctuosa Alni*, of which latter Barbut says:—"this pretty, quiet, melancholy fly is often fatally entangled in the clammy juice that oozes from the leaves. Its colours are chiefly yellow and brown, body black." Of vegetable parasites, *Erineum alneum*, Grev. *Scot. Crypt.*, 157,2.; "convex, dotted, in irregular patches; white, chang-

ing to purple and brown," is frequently found on the leaves; also *Xyloma alneum*, "single, roundish, crowded, black;" and *Dothidea alnea*, figured in Grev. *Scot. Crypt.*, 146,2. Horses, Cows, Goats, and Sheep browse on Alder. Swine refuse it. The leaves, when eaten by Cows, are reputed to increase their milk. If planted in a low meadow, the ground surrounding it will become boggy; whereas if Ash be planted, the roots of which penetrate a great way, and run near the surface, the ground will become firm and dry. In Japan the cones are used to dye black, and sold ready dried. The branches serve to make charcoal, and the knots of the trunk are beautifully veined, and used by cabinet-makers. Theophrastus mentions the uses of the bark for dying skins, as does Pliny the durability of the wood for piles and water-pipes. Mr. Gray asserts the inner bark to be purgative. Some of the largest trees of this description in England are reported by Gilpin to grow at Bishop's-Aukland, Durham. From their indestructibility in moisture, and natural situation, few trees are more frequently discovered beneath the surface of the earth than the Alder. The wonderful appearances of prostrate forests of different kinds of trees occasionally presented to view, have induced many interesting speculations as to their history.

Alopecurus.—Αλωπεχȣρος, from Αλωπηξ, a Fox, and ȣρα, a tail, in allusion to the form of the spike.

Alopecurus pratensis, Meadow Fox-tail Grass.—This is one of our very best Grasses for permanent pasture, being early, plentiful in produce, and grateful to cattle in general. It has the power of vegetating very quickly, and will bear to be cut twice a year to advantage. It naturally prefers a moist soil, and is best adapted for the improvement of such wet meadows as have been drained of their superfluous moisture, where, if due attention be paid in its introduction, it soon forms itself into a close thick turf, and from its rapidity of growth will maintain itself against many of the more powerfully creeping kinds. Mr. Sinclair informs us, in his very excellent and valuable work, *Hortus Gramineus Woburnensis*, that this Grass forms part of the produce of all the richest pastures he had examined in Lincolnshire, Devonshire, and in the Vale of Aylesbury; and that he found it still more prevalent in Mr. Westcar's celebrated pastures at Creslew than in those of Lincolnshire and Devonshire.

For a curious account of the larva of a species of Fly which feeds upon the seeds, and is again fed upon and kept within bounds by *Cimex campestris*, see Withering's note, and Baxter's *British Flowering Plants*.

Alopecurus agrestis, Slender Fox-tail Grass.—A very troublesome weed in many places amongst Wheat, and execrated by the farmers under the name of "Black Bent," or "Spear-grass." It is most prevalent in beggared soils, and will bear to be cut down repeatedly in the same season. The best remedy is careful husbandry, and bringing the land into "good heart." The herbage is compara-

tively of no value, and appears to be left untouched by every description of cattle. A large portion of the seeds of this plant are yearly destroyed by a minute orange-coloured maggot. The seeds are also acceptable to Pheasants, Partridges, and smaller birds.

Alopecurus bulbosus, Bulbous Fox-tail Grass.—This plant seems by Nature a meadow Grass, and Dr. ANDERSON suggests that, as its matted roots give an unusual firmness to the surface of the ground, it may be serviceable to prevent soft and moist soils from being poached by the feet of cattle.

Alopecurus geniculatus, Floating Fox-tail Grass, Geniculate Fox-tail Grass.—In dry situations, as on walls, &c., the leaves and stem are greatly diminished in size, and the roots become bulbous, with excessively long fibres. This transmutation has sometimes occasioned *A. geniculatus* to be mistaken for the real *A. bulbosus.*

Alopecurus Alpinus, Alpine Fox-tail Grass.—This plant seems quite unknown to botanists abroad, and is very rare indeed in this country. It is, however, plentiful in North America and Spitzbergen.

Althæa.—Αλθαια, from αλθεω, to heal. So named from its healing qualities.

Althæa officinalis, Marsh-mallow, Mymote.—The whole plant, particularly the root, abounds with mild mucilage. The root, boiled, is much used as an emollient cataplasm, and an infusion of it is very generally prescribed in all cases wherein mild mucilaginous substances are useful. Of several officinal preparations from this herb, the syrup alone is now retained. Mallows have not only been long celebrated for assuaging wounds, but were used to decorate the graves of our ancestors; and so indispensable were they deemed to each domicile of the living, that, as a matter of decided ill omen, the poet exclaims—

> "Alas, when Mallows in the garden die."

Alyssum.—From *a*, neg., and λυσσα, the bite of a mad Dog; it formerly being considered efficacious against hydrophobia.

Alyssum maritimum, Sweet Alyssum.—It is commonly cultivated in gardens, for its agreeable honey-like scent; and is considered a valuable acquisition to the apiarian border.

Amaranthus.—From *a*, not, and μαραινω, to decay. Flowers which do not fade, commonly called "everlasting flowers."

Ammophila.—Named from αμμος, sand, and φιλος, a lover, on account of its locality.

Ammophila arundinacea, Sea Mat-weed, Marram, Sea-reed (Starre or Bent, in Scotland).—This Grass grows only on the very driest sea-shores, and prevents the wind from dispersing the sand over the adjoining fields, which is not unfrequently the case where this plant is wanting. Many a fertile acre has been

covered with sand and rendered useless, which might have been prevented by sowing the seeds of this plant. The Dutch have profited by the knowledge of this fact. Queen ELIZABETH on this account forbade the extirpation of it. It is planted on some of the flat coasts of Norfolk to repel the sea, and is also suitable to the light lands of that country. Mr. WINCH remarks that this plant, together with a few others which seem designed by Nature to bind the loose sands of the sea-shore by their creeping roots, is the means of forming the low round-topped hills, called "Binks," along a considerable part of our northern coast. A legislative enactment, 1742, for the preservation of this plant, extends generally to the north-west coast of England; but such persons as claimed prescriptive right of cutting it on the sea-coast of Cumberland are said to be exempt from its operation. The Scottish parliament likewise protected this plant, together with *Elymus arenarius*, by a penal statute.

Anagallis.—The etymology of this word is exceedingly vague. BLANCHARD derives it from ανα; and γαλλος, a capon; because it scatters fruitless seed.—DIOSCORIDES from αναγω, to draw from, because it was anciently used to draw thorns or other substances out of the flesh. PLINY from ανα, and γαλα, milk, because it has the property of coagulating milk; or from ανα, and γαλλις, a river, in Phrygia, upon whose banks it grew in abundance. Some from γαλλις, the Hyacinth, because it is like it in colour; and some from αγαλλω, to adorn, because it beautifies and adorns hedges and the banks of highways, or from αναγελαω, to laugh; because, by curing the spleen, it disposes persons to be cheerful. The flowers of this genus are elegant, scarlet, blue, or pink.

Anagallis arvensis, Scarlet Pimpernel, Poor Man's Weather-glass.—It closes on the approach of rain; and from its susceptibility has acquired the name of Shepherd's or Poor Man's Weather-glass; nor has this property escaped the observation of the *Musæ Rusticæ*—

"Clos'd is the pink-eyed Pimpernel:
'Twill surely rain. I see, with sorrow,
Our jaunt must be put off to-morrow."

"And Pimpernel whose brilliant flow'r
Closes against the approaching show'r
Warning the swain to sheltering low'r
From humid air secure."

The flowers in finer weather only continue open from about eight, a. m., till towards four, p. m. Hence distinguished by LINNÆUS as one of the *Flores Solares*, admissible in constituting the *Horologium Floræ*, the "*Herbas horarum indices*" of PLINY; that

"Trace with mimic art the march of time."

and is elegantly alluded to by Felicia Hemans in her *Dial of Flowers*, for an extract of which see Baxter's *Flowering Plants*; in which is also an account of the delicacy of the structure and elaborate formation of this elegant little plant. Small birds are fond of the seeds. Sir J. E. Smith remarks that it is very rarely found of a brilliant white.

Anagallis tenella, Purple flowered Moneywort, Bog Pimpernel.—It yields to none of our wild plants in elegance, and, being scarcely known on the Continent except in the south, is a welcome present to German, Swiss, and Swedish botanists. In Withering are the following appropriate lines—

> " Of fairer form and brighter hue
> Than many a flower that drinks the dew
> Amid the garden's brilliant show."

Anchusa.—From αγχω, to strangle, on account of its astringent qualities, or from αγχουσα, paint, the roots of one species, *A. tinctoria*, yielding a red dye formerly used to stain the face, and for other purposes.

Anchusa sempervirens, Evergreen Alkanet.—This is one of our prettiest native plants, and well deserves a place in the flower garden. Dr. Withering observes that the Alkanet-roots produced in England are very inferior for yielding a fine red colour to those of *A. tinctoria* grown in the Levant. The cortical parts only give the dye.

Andromeda.—From the constellation so called; these plants prevailing in northern latitudes; or rather, perhaps, from a fanciful allusion to the fate of the princess of that name, whose beauty was doomed to pine on a desolate rock, surrounded by the monsters of the ocean; as her vegetable prototype hangs its drooping head, suffused with blushes, while possessing in solitude the turfy hillock, in the midst of swamps and loathsome reptiles.

Andromeda polifolia, Marsh Andromeda.—An elegant evergreen shrub, scarcely a span high, whose rose-coloured drooping flowers are a good deal concealed among the terminal leaves. A very interesting account of this charming plant is given in Linnæus's *Lapland Tour*, I., 188. See also Hooker, *Scot.*, 126.

Woodside, near Liverpool,
Feb. 7, 1838.

(To be continued.)

ON LISTS OF FLOWERING PLANTS FOR THE MONTHS.

BY THE EDITOR.

AT page 87 of the present volume we announced our intention of publishing lists of plants for every month in the year, which catalogues were kindly supplied by a correspondent. In abandoning this plan, therefore, a few words of explanation may be necessary. Our chief reason for discontinuing the lists was the great length to which some of them would have extended, and we were, moreover, unwilling to divide them. Further, the plan adopted by our correspondent appears less complete than desirable. To be of much use to either the student or the proficient botanist, the lists should be framed from actual observation, and not compiled from published works. Then, again, it should be distinctly stated whether they are intended for an extensive or only for a limited tract of country, adding, where necessary, the part of the month in which the plants flower. In most cases *b* (beginning), *m* (middle), *e* (end), would designate this with sufficient accuracy.

A series of catalogues, thus arranged, might, we think, prove of considerable service to the student, and would aid even the more advanced botanist, whose observations, at the same time, would correct any errors and supply any deficiencies noticed in the lists.

Although we have finally determined on declining the publication of the further articles on the same plan in our possession, we cannot regret the insertion of those which are already before our readers, relating to the flowering plants of February, March, April, and May, since these are less likely to contain numerous and glaring inaccuracies than those of greater length. In an average season, they may probably prove generally correct in the midland counties, Yorkshire and Lancashire; and possibly the deficiencies of the present lists, now pointed out, may induce the same esteemed correspondent, or some other botanist, to supply our readers with a complete list of flowering plants for every month in the year, on an improved method. Such a series, if practicable, might be published next year, beginning with *The Naturalist* for January, 1839.

Campsall Hall, May 1, 1838.

CORRESPONDENCE.

Plan for an Oological Cabinet.

To the Editor of the Naturalist.

Godalming, April 16, 1838.

My dear Sir,—I have great pleasure in complying with the wishes of your correspondent Mr. Hall (p. 211), and I trust that the wood-cut (Plate 2, Fig. 4) will give the necessary information; it represents the oological cabinet belonging to the Norfolk and Norwich Museum, made under my direction. The cases are 15 inches by 12 inches, and of various depths; the first pair, commencing from the bottom, being $3\frac{1}{2}$ in., the next four pair $2\frac{1}{2}$ in., and the remaining four 2 in. The arrangement to commence at No. 5, with the first order, *Raptores* (Preyers), which will occupy this and the next case, No. 6. The second order, *Insessores* (Perchers) will occupy Nos. 7 to 12; the third order, *Rasores* (Scratchers), Nos. 13 and 14; the fourth order, *Grallatores* (Waders), Nos. 15 to 17, and 18, if required; the remainder, No. 1 to 4, for the fifth order, *Natatores* (Swimmers). The cases at the Norwich Museum are lined with coloured paper, and the specimens placed in rows, the bottom having been first divided with black lines to separate the species. In my cabinets they are separated with thin wooden partitions, and the specimens laid upon green Moss. Several of my friends use small card-paper trays, and their specimens are placed upon pink cotton, which has a very pleasing effect. These little trays are easily removed to make way for the introduction of a new species from time to time, as they are obtained. This cabinet is only capable of containing a collection of British Oology, as figured in Mr. Hewitson's beautiful work. I strongly recommend that the cases should be glazed, which contributes much towards the preservation of the specimens.

I remain, my dear Sir,

Yours very truly,

Neville Wood, Esq. J. D. Salmon.

The Peewit Lapwing's Mode of taking its Food.

To the Editor of the Naturalist.

Catherine Villa, near Worcester,
March 1, 1838.

Sir,—Should you think the following facts relative to the Lapwing worthy of insertion in your Magazine, they are at your service.

At a gentleman's house in Upton-upon-Severn, I lately saw one of these birds running about his garden, and which was caught when quite young* upon a common in the neighbourhood. On observing the bird standing upon a grass plot in the garden, and shaking as if it had the ague, I inquired the cause, and was told that it was the manner in which it obtains its food. This I observed it to effect in the following manner:—It advances four paces, then stands firm on one foot, and, with the other in advance, it agitates the grass by moving the knee of that foot backwards and forwards; it looks intent all the while on the ground, to see if there is any motion in the grass; on perceiving any, it immediately plunges its beak therein, to catch any unfortunate insect or Worm that may be attempting to make its escape. It then proceeds four other paces, beginning with the advanced foot, which brings the other foot at the fourth step in advance, with which it agitates the grass as before, and so on, alternately.

I am, Sir,

Your most obedient servant,

NEVILLE WOOD, Esq. JABEZ ALLIES.

SUGGESTIONS FOR A WORK ON THE LOCALITIES OF BRITISH INSECTS.

To the Editor of the Naturalist.

Bewsey House, near Warrington,
April 3, 1838.

MY DEAR SIR,—I beg to draw the attention of naturalists to a desideratum in our entomological literature, which I wish much to be supplied. Mr. WATSON deserves the thanks of all botanists for his *Guide to the Localities of the Rarer British Plants.* Why should there not be a similar guide to the localities of the rarer insects? The importance and advantage of such a work to entomologists is obvious. And were any competent individual to attempt the task, he would undoubtedly receive much assistance. To this end the work might appear periodically; and its success would be further insured by the price being moderate. The localities of the rarer species only would be necessary. A list of all such as are plentifully and generally distributed, might be given at the conclusion. The extent of the work would thus be considerably diminished, as the repetition of the same species under each of the counties would be rendered needless. Further suggestions need not be given here, and I conclude by hoping that attention will be paid to this subject, as I feel convinced it deserves and demands it.

Yours very truly,

To NEVILLE WOOD, Esq., &c. PETER RYLANDS.

* When covered with down, this bird utters the same "peewit" cry as the adult, but, of course, in a more *chicken-like* tone.—ED.

Occurrence of the Pied Flycatcher in Nottinghamshire.

To the Editor of the Naturalist.

Sir,—Being unknown to you, and moreover quite a tyro in Ornithology, you may consider it presumption in me to trouble you with this letter. I merely wish to call your attention to a bird which I believe is generally considered very scarce, viz., the Pied Flycatcher, of which species I was fortunately enabled to obtain a specimen the other day. It was shot by a gardener at Rufford Hall, near Ollerton, Nottinghamshire, on the 19th of April, 1838. It had been observed by him, with its mate, flying about the trees in the orchard. The other bird, I believe, was not seen afterwards.

If you can inform me in what part of Britain and in what quantities these birds are found, in your valuable Magazine, you would greatly oblige

Your obedient humble servant,

Harrow, Middlesex,
May 4, 1838.

H. J. T.orre (see p. 420)

[The Pied Flycatcher (*Muscicapa luctuosa*, Temm.) is in Britain a very rare and local bird. It is supposed to be indigenous, but we feel little doubt of its being a summer visitant, appearing in spring and departing in autumn. The counties in which it chiefly occurs are Yorkshire—especially the West Riding—Cumberland, Westmoreland, Lancashire, Staffordshire, and Derbyshire. Mr. Selby has seen specimens from Dorsetshire. The Pied Flycatcher of course breeds with us.—We thank our correspondent for the above notice, and are happy to give it insertion, although it is preferable, in every possible case, that notices of the occurrence of *facts* should not be anonymous. Where reasoning alone is concerned, this is of no importance; and it is certainly far better that anonymous facts of interest or importance should be published than that they should be altogether lost to science.—Ed.]

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

ORNITHOLOGICAL SOCIETY.

There is a nest of the Bean Goose in St. James's Park, containing seven eggs, being the first known instance of the species propagating in domestication, if domestication it can be called, for the Society's birds are under no restraint whatever, enjoying the full use of their wings, of which, at times, they do not

forget to avail themselves. The Bean Goose is never seen near its nest except when laying, and it covers its eggs before leaving them, like a Duck. The nest is placed under a thick Box-bush, in a place similar to that which a Duck would choose. The eggs are very pure white, and of a large proportional size. A Canada Goose has a nest within half-a-dozen yards; it is guarded at all hours by the two birds, which are noisy and fierce, contorting their necks singularly on the approach of any person. This species invariably selects an open, uncovered situation, merely scraping a slight hollow in the ground. The large China Goose, however—like the domestic breed—prefers an artificial box in which to retire. We are confident the Smew would breed if it had a mate. It has a curious manner of throwing back the neck, uttering at the same time a very peculiar low rattling note, evidently expressive of its desires. The Shoveller raises and lowers its neck several times successively, accompanying the movement by a low thick sound; this it does particularly after driving a rival from its mate. We have often seen a pair of Shovellers with their bills quite immersed vertically downwards, sail round and round in a small circle for perhaps a quarter of an hour together, thus causing a small eddy, and straining floating particles from the water by means of their bill-laminæ.

Few spots are more interesting to the ornithologist than St. James's Park. The superiority of its arrangements over those of most other collections of a similar nature is both striking and considerable.

BOTANICAL SOCIETY.

March 16.—J. E. Gray, Esq., F.R.S., Pres., in the chair.—Mr. D. Cooper, A.L.S., delivered his second lecture on the practical part of Botany.—The Secretary announced a splendid donation of foreign plants found in different parts of Europe, comprising 1,000 species, presented by H. B. Fielding, Esq., Corresp. Memb. of the Soc., and Local Sec. for Lancashire.—Dr. Robert J. N. Streeton was elected a Corresponding Member.—A paper from J. Riley, Esq., was read, being remarks on a paper lately read before the Society by Mr. White, "On Hybridity in Ferns," translated from a paper by M. Martens, of the Royal Academy of Brussels.—Specimens of *Gymnogramma colomelanos*, *G. chrysophilla*, and *G. sulphurea*, were exhibited.

April 6.—J. E. Gray, Esq., in the chair.—The Secretary announced donations of books from Mr. W. Baxter, A.L.S., and also of some plants from Mr. Edwin Lees, Corr. Memb., and Loc. Sec. for Worcestershire.—Mr. Cooper delivered his third lecture on practical Botany.—A leaf of *Victoria regina*, sent to the Society by Mr. Schomburgk, was exhibited.

The Secretary read a paper from R. H. Schomburgk, Esq. (still in British Guiana), on *Triplaris Americana*, the Ant-tree of Guiana. The trunk is

slender, grows up straight, and its erect branches form a pyramid. It is unisexual; and the flowers of both sexes are insignificant; those of the male last only for a few days, when they dry up; this is likewise the case with the petals of the females. The segments of the calyx, however, continue to grow, changing in their growth from green to white and vermillion, and become so attenuated that the branched nerves are easily perceptible. In that state they are three times as large as the fruit, which is still protected by the tube of the calyx: and the whole might, in appearance, be compared to a shuttlecock. The risps are dense, and the tree presents now a most elegant appearance. One unacquainted with the contrary, would consider the tree covered with white blossoms tinged with red, among which the dark green leaves have only occasionally room to make themselves visible. The incautious botanist who, allured by the deceptive appearance, should approach the tree to pluck the blossoms, would rue his attempt. The trunk and branches are hollow, like those of the Trumpet-tree (*Cecropia*), and provided between space and space with partitions, which answer to the position of the leaves on the outside. These hollows are inhabited by a light brownish Ant, about two or three-tenths of an inch long, which inflicts the most painful bites, causing swelling and itching for several days. If they find themselves captured, they attack and kill one another like Scorpions. The Aramah Indians call the tree "Jacuna," and the Ant, "Jacuna sae."

ENTOMOLOGICAL SOCIETY.

March 5.—J. F. Stephens, Esq., F.L.S., President, in the chair.—The memoirs read at this meeting were,—1st, Observations upon the habits and other peculiarities of *Brachelytra* (genus *Staphylinus*, Linn.), by F. Holme, Esq.; 2nd, Description of a new Strepsipterous insect, found in Brazil, and inhabiting the body of one of the Sand Wasps, *Sphegidæ*, by R. Templeton, Esq.; 3rd, Description of *Platyrhopalus angustus*, a new species of *Paussidæ*, brought from the interior of India by Assistant-Surgeon Downes, by J. O. Westwood, Sec. E. S. —Mr. Saunders exhibited a specimen of the splendid *Urania Rhipheus*, which had been captured in the channel of Mozambique, many leagues from land.—Mr. Bainbridge communicated a method for ridding insects saturated with a greasy matter, which occasionally exudes from them when placed in the cabinet, by immersing them in petroleum.—Messrs. Hope and Raddon made some observations upon the distinctions between the two gums, anime and copal, which have been respectively considered to contain insects, and the latter member stated that the singular noise emitted by the Death's-head Hawk-moth (*Acherontia atropos*), and which has so much perplexed physiologists, is sometimes produced by the insect whilst in the chrysalis state.

April 2.—J. F. Stephens, Esq., President, in the chair.—Mr. Barker com-

municated a method of driving away the minute Ant which had recently become so troublesome in houses in the neighbourhood of London.—Mr. Bainbridge exhibited a singular monstrous individual of *Clivina fossor*, one of the small ground Beetles.—Notes were read from Dr. Buckland and the Rev. M. E. Berkeley, on the vegetable nature of various excrescences occasionally observed upon insects, the disease to which the House Fly is subject in the autumn, being, according to Mr. Berkeley, caused by the presence of a minute Fungus, and not being a plethoric kind of disease, as supposed by some writers. The Secretary communicated various observations recently made upon this subject, and upon the analogous parasitism of insects on the bodies of insects: stating the occurrence of one of the *Strepsiptera* in *Ammophila sabulosa*, one of the Sand Wasps.—A large larva of one of the Lamellicorn Beetles, was also exhibited, from the collection of the Rev. F. W. Hope, from which a Fungus nearly two inches long had been produced.—The memoirs read were, 1. On the destruction of the black caterpillar of the Turnips by poultry, by Mr. Sells; 2. Monograph on the genus *Holoptilus*, by J. O. Westwood, Sec. E. S.; 3. Conclusion of a memoir on the different species of insects employed in various parts of the world as food, by the Rev. F. W. Hope.

SHEFFIELD LITERARY AND PHILOSOPHICAL SOCIETY.

On Friday night, April 6, the regular monthly meeting of the Philosophical Society was held in the rooms at the Music Hall, Charles F. Favell, M.D., President, in the chair.—Several books were presented, from Mrs. Stovin, including Stillingfleet's *Facts on Natural History*, Ray's *Discourses and Letters*, Martyn's *Plantæ Cantabrigienses*, Linnæus's *Flora Lapponica*, and Henslow's *Botany*. There was likewise laid on the table, by Mr. Moss, a large specimen of the "Alleghany Coal," which, though by no means equal in appearance to much of the bituminous Coal of this country, belongs, nevertheless, to the same geological era, and will doubtless become, in course of time, of vast importance to that quarter of the United States in which the formation occurs.—The oft-repeated subject of the erection of a Philosophical Hall was again mooted, and a set of beautiful architectural drawings, relative to what such a structure should be, was exhibited. The gentleman who moved that this subject should be referred to the Committee, remarked, that while he had long been convinced that the Society would never be in a position to build out of its own funds, nor able to beg the money requisite for such a purpose, he had latterly entertained the opinion that a hall might be advantageously raised in shares, even if it might not be to the interest of some individuals, of competent means, to erect, on private speculation, such a building with the requisite accommodations, in the certainty of finding a satisfactory tenant.—Dr. Holland read an elaborate and interesting

paper on the powers which move the blood in the veins. The subject was of too professional a nature to justify more than a brief notice in this place. It may be stated, however, that the main drift of the reader, in his examination of a great number of theories, was to prove, contrary to the opinion of several eminent physiologists, Dr. ARNOTT in particular, that the motion of the blood through the veins is not due to the impulse of the heart, which impels sanguineous fluid through the arteries, but rather to the contractibility of the capillaries—that immense system of minute vessels, which lie between the aorta, by which the arterial blood goes from the heart, and the vena cava, by which it is returned from the veins. A highly interesting conversation followed the reading of Dr. HOLLAND's paper.—*Sheffield Iris, April* 10, 1838.

OXFORD ASHMOLEAN SOCIETY.

March 26.—Dr. BUCKLAND in the chair.—Mr. HOLME, of C.C.C., read a paper on the early accounts of the Natural History of the Giraffe. A representation of this animal occurs amongst the monuments of Thebes, where the chiefs of four nations bring tributes to the Egyptian king, THOTHMES III., who is supposed to be the PHARAOH in whose reign the Israelites quitted Egypt. It seems doubtful, however, whether the animal was known to the Israelites. It was certainly unknown to ARISTOTLE. TIMÆUS (B.C. 260), the historian of Sicily, as quoted by KAZARINE, the Arabian, was evidently acquainted with it. AGATHARIDOS (B.C. 180) mentions its name as originating from its combining the spots of the Panther with the size of the Camel, and states that its neck was sufficiently long to enable it to feed upon trees. From this time till the reign of JULIUS CÆSAR no mention of this animal occurs. PLINY says that the earliest specimens seen in Europe were exhibited by that emperor; from which fact it may be inferred that the animal was not at that time found in the regions of Africa north of the Zahara. Henceforward, the Giraffe was not unfrequently exhibited in Rome. STRABO gives a detailed account of it, which is the more valuable, as from his extensive travels in Upper Egypt it is probable that he had seen the animal in its native state. HORACE and PAUSANIAS allude to it. PLINY's account is remarkably meagre. The name of *Nabis*, by which he says it was known amongst the Æthiopians, corresponds exactly with the Hottentot term *Naip*. It is curious that he should have taken no notice of its horns. OPPIAN, who had probably seen some of the specimens brought over by the Gordians in the third century, gives an accurate description of it in the third book of his *Cynegetica*. After the removal of the seat of empire to Constantinople, the Giraffe was but rarely seen in Europe. After HELIODORUS, no author, for several centuries, notices it, as the Arabian conquest of Egypt had probably cut off all com-

munication between the Greeks and Æthiopia. Arab authors, however, according to Bochart (1663), frequently mention it. It seems to have been reintroduced into Europe at the time of the Crusades; but the only notice of it known to the author occurs A.D. 1260, amongst the presents sent by the Mameluke Sultan of Egypt to the Emperor Michael Palæologus. This was probably the last specimen seen at Constantinople previous to the Turkish conquest, and with the exception of two sent over by the Sultan of Egypt, in the fifteenth century—one to the Emperor Frederick III., the other to Lorenzo de' Medici, the author has not found any allusion to its having been seen alive in Europe from that time to its recent introduction. Frequent notices, however, of it are given by European travellers who visited the courts of Oriental sovereigns. The animal was found, towards the end of the 18th century, at the Cape of Good Hope; and, its skin having been brought to Europe by Patterson and Gordon, enabled Buffon to describe it; and a complete account of its habits was furnished by Le Vaillant. It is only within a few years that it has been re-discovered in its original known *habitat* of Abyssinia and Kordofan, from which countries, since their conquest by the Pacha of Egypt, the beautiful specimens now at Paris and London have been introduced to the notice of Europeans.—*Athenæum, April* 7, 1838.

BRISTOL, CLIFTON, AND WEST OF ENGLAND ZOOLOGICAL SOCIETY.

The Annual General Meeting of this Society was held on Wednesday. The report was satisfactory. It appeared that £925. 18*s.* had been taken at the gate, £102. 16*s.* from subscribers, and at the Fêtes, £797. 6*s.* 4*d.* had been received. The expenses of the Fêtes amounted to £46. 16*s.* 10*d.*—*Gloucester Chronicle, April* 14, 1838.

CHELTENHAM LITERARY AND PHILOSOPHICAL INSTITUTION.

April 24.—The business of the evening being over, it was announced that the last meeting of the session would take place on Tuesday evening, May 2, when a paper "On the Study of Natural History" was to be read by Mr. Buckenan, preliminary to receiving the report of the Sub-Committee appointed to consider the best course to be pursued for the purpose of establishing a section for the cultivation of Natural History in immediate connexion with the Institution, and to be entitled the Natural History Section.—*Cheltenham Looker-On, April* 28, 1838.

EXTRACTS FROM THE FOREIGN PERIODICALS.

ZOOLOGY.

1. On the Proboscis of the Elephant; by Dr. Campbell.—The powers of this organ are so wonderful and various, that an inexperienced dissector must fail in elucidating its composition. Barring Man, the Elephant must surely be considered as the lord of the animal kingdom; largely endowed with intelligence, sagacity, and power, it remains chief among the desert wilds, and among the numerous creatures devoted to the service of Man. Where is its equal? Among all the organs of sense and motion, the trunk is the most indispensable to the preservation of the individual. Eyes, ears, a limb, and generative organs could be dispensed with, but deprived of the proboscis, the Elephant in its free state could no longer preserve its being; purely herbivorous, and that in the largest sense of the word, the formation of the animal is such that he is deprived of the mouth as a means of grasping the aliment on which alone he can live. The shortness and immobility of the neck prevents him from bringing the mouth downwards to seize vegetables little raised from the surface of the earth, and the same cause prevents his applying it to the purpose of furnishing himself with the leaves of trees and shrubs. Independent of this shortness and limited action of the neck, his system of dentition is such as to preclude the possibility of his cutting or pulling Grass with the mouth from the ground. The lower jaw with incisor teeth sloping outwards, by which the Ruminants are enabled so freely to cut their herbivorous food on the ground, is widely different in the Elephant. At its inferior part, the lower jaw is narrow and sharp, and without incisor teeth; the lower lip projects considerably beyond the jaw, and the upper jaw is also destitute of incisors. All these circumstances show that he never could exist unassisted, without some other means being given to him by which he could bring his food under the action of his grinder teeth. This means is the proboscis, and perhaps throughout animated nature, it is without a superior, and scarce has an equal among corporeal organs; in it are concentrated the organs of touch, the channels to the internal olfactory apparatus, the prehensile powers of a noble and huge animal, and added to this, it is the external organ of respiration, and is used as a pump and reservoir for drawing up and containing the fluid part of its food, then passing it into the pharynx. With the proboscis, he is enabled to swim the deepest rivers, to bathe and fan himself, and with it he can with equal ease pick a pin from the infant fingers of his keeper's child, or fell a forest tree. The wonderful propensities of this organ have been long known and acknowledged in the east, and the polytheists of India have seldom made such a happy choice of

emblems as that one in which wisdom and universal power, or the deity GANESSA, is characterised by the Elephant's trunk. It arises by strong muscular fibres from the interior part of the os frontis, the ossa nasi, and superior maxillary bones, and may be characterised as a flexible fleshy process, extending from its origin to the ground, being longer or shorter, smaller or larger, according to the height and size of the individual Elephant it belongs to. It is covered by the common integuments, and tapers gradually from the attachment with the skull, to its point; where it is terminated on its anterior side by a finger-like process jutting beyond the posterior termination. The inner side of this finger is not covered by the common integuments, and in it seems to be concentrated the whole sense of touch belonging to the animal, and that to a most exquisite extent. The trunk is divided along its mesial line by a strong and thick membranous partition into two equal-sized cylindrical canals, which communicate with the nares and throat, and are each lined by a membrane similar to that forming the partition between them; this membrane does not appear to be furnished with any secretory apparatus, and the walls of each canal are ever apart, owing to the strong nature of the centre partition and lining membrane. The canals are not true cylinders, being flat on their lower side, and arched on the upper, precisely in the same manner as is the trunk itself. Through these canals the animal breathes and smells, and with them he raises water by suction, and transfers it to the pharynx through the mouth to be swallowed. I could not discover the means by which the water is prevented from passing directly into the throat; if this apparatus exists in the canals of the trunk, it must be immediately at the external orifice of the nares, for throughout the entire length of the trunk proper, there is no means for bringing the sides of the canals in opposition.—*India Review*, *August*, 1837.

2. SAGACITY OF ANIMALS.—A late number of the *Bibliothèque Universelle* contains some remarkable and well-ascertained instances of animal sagacity, from which we select the following:—

A person lodging in one of the fauxbourgs observed daily, for several weeks, six Dogs, who used regularly to come at the same hour, and assemble in an adjacent meadow, where they sported and amused themselves. The motive of their assembly was as obviously the purpose of sport as that of persons who go to a ball or a spectacle, at an appointed hour.

An attempt was made to teach a Dog to mount a ladder; but the animal was soon fatigued with the exercise, and escaped. But the next day he was seen to return to the ladder alone, and voluntarily endeavour to succeed in mounting it, as if the motive of ambition impelled him to renew the attempt.

A milkman who used to go before the break of day in winter to fetch milk from a farmer who supplied him, had a Dog whom he employed to carry his

lantern. One morning this Dog was accidentally locked up at the time his master departed. The moment he was liberated, however, he followed him; and when he overtook him, finding that his master had not the lantern, immediately returned home; and, seizing the lantern, followed his master with it.

A tame Pigeon who had been domesticated in a kitchen, happened to see a Fowl killed; on witnessing this, the bird immediately took flight, and never returned to the kitchen.—*Monthly Chronicle, March*, 1838.

BOTANY.

3. Phosphorescent Vegetables.—In consequence of the observations made on the phosphorescence of the *Agaricus* of the Olive-tree, M. Vallot has been making some researches concerning those plants which have been mentioned by the ancients as exhibiting the same phenomenon. The descriptions of plants in those days were so imperfect, that it would be difficult to state anything positively on their authority; but M. Vallot thinks there is every reason to believe that this phosphorescence proceeded from certain Fungi.

GEOLOGY.

4. Fossil Teeth of Oran.—M. Duvernoy has submitted several fossil teeth to the French Academy of Sciences, which he received from Oran, together with a piece of osseous breccia. The latter confirms the existence of these brecciæ on the African shores of the Mediterranean, as well as on those of Europe. If it were possible to demonstrate that the osseous breccia of Africa contains the same species of animals as that of Europe, their identity as to cause would be confirmed, as well as their extent. A further study of both would also, in all probability, throw great light on the epoch in which the Mediterranean was formed. The osseous breccia of Oran, like that of Gibraltar, &c., is a calcareous concretion, of a fine rust-colour, and of earthy fracture, and may be compared to brick clay, well baked, and full of small irregular cavities. Most of the isolated teeth in it are those of fishes. It is remarkable, that all those examined by M. Agassiz, and mentioned by him in the *Voyage dans la Régence d'Alger*, belong to the Shad, or genus *Alosa* (*Alosa elongata*, Agassiz), as if entire banks of the fish had been enveloped in one common catastrophe. M. Duvernoy has only found detached teeth, and no fragments of the skeleton of the fish, and therefore is unable to do more than conjecture to what they belong. He thinks he has recognized those of the *Chrysophris globiceps*, and neighbouring species. Besides these, is one belonging to the *Sargus* of Cuvier, an incisor, composed of enamel of different colours. Two other teeth, he presumes, belong to a marine animal hitherto unknown, and bearing no resemblance to those of any living or fossil Mammalia.—*Athenæum, March* 31, 1838.

CHAPTER OF MISCELLANIES.

ZOOLOGY.

Chrysomela polita.—Three specimens of this beautiful Beetle were taken here last summer, June 16, by my brother, who found them sitting on the leaves of *Geum rivale* [the Water Avens.—Ed.], at the side of Kinnes-burn. The male of this insect is considerably smaller than the female.—Henry Buist, *Law Park Cottage, near St. Andrews, March* 12, 1838.

Conchology of the Neighbourhood of Liverpool.—The following list of shells, with remarks on the localities of some of the species, has been furnished me through the kindness of Thomas Glover, Esq., of Manchester, and may perhaps be useful to such of your readers as reside in this neighbourhood :—

Helix nemoralis, about a dozen varieties; *Succinea amphibia ; Limnæus pereger ; L. stagnalis ; L. elongatus ; L. palustris ; Physa fontinalis ; Aplexa hypnorum ; Planorbis carinatus ; P. vortex ; Turritella terebra ; Cingula ulvæ ; Scalaria clathrus ; S. Turtoni ; Paludina vivipara*, Southport ; *P. impura ; Natica glaucina* ; *Fusus antiquus* ; *Rostellaria pes-pelecani ; Pecten opercularis ; P. varius ; Nucula nuclea ; Mytilus edulis ; M. pellucidus ; Modiola vulgaris ; Anodon cygneus ; Cardium edule ; Mactra solida* ; *M. subtruncata ; M. stultorum*, two varieties ; *Amphidesma compressum ; Donax trunculus ; Psammobia Ferroënsis ; P. solida ; Cyprina Islandica ; Venus gallina ; Cyclas cornea ; Pholas crispata ; Ph. candidus ; Solen ensis ; Mya truncata ; M. arenaria* ; *Pandora inequivalvis* ; *Echinus*, several species.

"The arrangement," observes Mr. Glover, "is Fleming's, except as regards the land and fresh-water shells, for which I have adopted Dr. Turton's names. I would wish to observe that no shell ought to be accounted as native which is not found alive in its natural situation. You instance *Rostellaria pes-pelecani*, specimens of which I picked up last summer near Formby; also *Turritella*, *Scalaria*, *Fusus*, and many others, inhabitants only of deep waters, and most probably washed up from Conway Bay. Many of the interesting varieties of *Helix nemoralis* are to be found amongst the sand-hills at Wallasey and Leasowes; *Succinea amphibia* on the low grounds near Leasowes; *Limnæus pereger* in the ponds about Wallasey; *L. stagnalis*, *L. elongatus*, and *L. palustris*, in the ponds round Liverpool; *Physa fontinalis*, *Aplexa hypnorum*, *Planorbis carinatus*, and *P. vortex*, in the same localities. *Cingula ulvæ* is very common at Southport, and sometimes gets washed along the coast. *Paludina impura* in the Leeds and Liverpool Canal. *Mytilus pellucidus* in prodigious quantities near the Lighthouse, westward. *Anodon cygneus* occurs in many of the ponds. *Cardium edule* occasionally on the banks, but probably plentiful a mile or two from shore.

Mactra solida is found at low-water mark (of spring tides only), opposite New Brighton, inclining westward; *M. stultorum* in the same locality, where also occur *Natica glaucina*, *Donax trunculus*, *Solen ensis*, and occasionally *Venus gallina* and *Mactra subtruncata*. This last is plentiful about the lighthouse southward. *Amphidesma compressum* is very common about Formby. *Cyclas cornea* is in almost all the ponds. *Pholas candidus* is found in the clay at extreme low-water mark, near the lighthouse, westward; also in the peat opposite Leasowes, near the lighthouse, westward, inside the muscle bank, and difficult to get at without a boat, the ground being dangerous to wade upon. I found it once only, and my subsequent attempts all failed; but if the place can be hit upon it is plentiful enough, and may be considered a rare shell; it appeared exactly opposite New Brighton. *Pholas candidus* is very abundant there, and it is surprising how seldom a live shell is seen in any cabinet. I never met with one that I have not supplied from your neighbourhood."—THOMAS GLOVER, *Manchester*.

I have ascertained two of the *Echini* found with us to be *E. spatagos* and *E. esculentus*. We have about twenty species of *Sertularia*, and a few *Turbulariæ* and *Flustræ* with us, a list of which I will forward when I get my specimens named by some competent person. At the same time I hope to be able to send some remarks on the Molluscous animals of the neighbourhood of Liverpool.

In conclusion, I may mention that THOMAS GLOVER, Esq., has liberally supplied the museum of the Royal Institution with most of the shells which he found in this neighbourhood, as well as some from other localities.—T. B. HALL, *Woodside, Liverpool, April* 9, 1838.

TURTLE DOVE SHOT NEAR SCARBOROUGH.—A young Turtle Dove was shot near this town in October, 1834, and is now in my possession.—PATRICK HAWKRIDGE, *Scarborough, Aug.* 7, 1837.

Æshna versus Æschna.—Mr. STEPHENS states, in his *Catalogue*, p. 303, that Mr. CURTIS was in error in employing *Æschna* for *Æshna*; but, in *Nom.*, 2nd edition, he (Mr. STEPHENS) adopts it also!—J. C. DALE, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

SPARROW'S NEST IN JANUARY.—We have had brought to our office a Sparrow's nest containing four eggs, and found in the roof of a cottage in Portlandfold.—*Sheffield Mercury, Jan.* 13, 1838. [We presume it was the frigid character of the weather during the second week in January which induced the Sparrow in question to build a nest at so unseasonable a period; or perhaps the frost acted in some way unknown to us, upon the brain of one of the penny-a-line writers for the *Sheffield Mercury*. If we might be allowed to speculate upon the matter, we would suggest, either that the cold had rendered the said reporter liable to

waking dreams, or, possibly, that it had stimulated him to exercise his craft—his notorious love of invention—with a view to the improvement and multiplication of his Christmas comforts!—Ed. *Nat.*]

Specimens of the Bohemian Waxwing (*Bombycilla garrula*) shot in Yorkshire.—A few specimens of this elegant bird have been taken with us, and others seen during the winters of 1830, 1832, and 1835. The pair in my small collection was shot in the latter year, near Scarborough, and kindly given to me by Mr. Benjamin Shaw.—Patrick Hawkridge, *Scarborough*, *Aug.* 7, 1837.

Nyssia zonaria.—At the meeting of our Natural History Society on Tuesday, specimens of the above interesting addition to our Fauna were exhibited to the members by Mr. F. Taylor, several eminent entomologists having been over from Manchester a few days before, and captured a large quantity. Mr. Cooke has also had great success in meeting with a good supply. A single specimen of the male was taken on the Rushes about half a mile below the Black Rock, at New Brighton, near Liverpool, in September, 1832; and about the middle of the same month, in the following year, from twelve to twenty specimens of the same insect, both males and females, were taken in the same locality. The discoverer was Mr. Nicholas Cooke, of Liverpool. Mr. Eveleigh, then President of the Banksian Society of Manchester, supposing it to be an entirely new species, took three specimens to London, for the purpose of having them described in the *Entomological Magazine.* Mr. Newman submitted them to the notice of Mr. Stephens, who had never seen anything like them before. Mr. Newman then applied to Mr. Children, whose entomological library stands unrivalled in this country, and who informed Mr. N. that the insect was *Nyssia zonaria* of both Hubner and Duponchel. The following description is copied from the *Entomological Magazine*:—

"Antennæ, with ciliæ, black, the shaft white; pilosity of mesothorax very long, dark brown, with two longitudinal white lines, and a dash of white at the base of each wing; body nearly black, with six delicate rings, of a pinkish-yellow colour; fore wings brown, with two oblique, transverse, white lines nearly parallel with the exterior margin, and within these are irregular white markings on the disk; hind wings white, with two broad bands, and the nervures brown; legs black, the tarsi annulated, with white. The female apterous, with seven rings on the body. The size is, as nearly as may be, that of *Nyssia hispidaria.*" —T. B. Hall, *Woodside*, *near Liverpool*, *April* 4, 1838.—[The genus *Nyssia* belongs to the order *Lepidoptera*, and contains three British species.—Ed.]

Animals eat in proportion to their Temperature.—Warm-blooded animals are continually eating; birds, whose temperature is the highest, incessantly, if they can obtain food; whereas the cold-blooded little and seldom. Some make

a meal only once in three or four months; Dr. STEVENS saw a large Rattlesnake, plump, active, and venomous, which was said not to have tasted food for nine months.—*Human Physiology, by John Elliotson, M.D., Part I.*, p. 242.

WHITE MOLES.—DAVID GRANT, Mole-catcher, residing at the Bridge of Moniack, lately caught three Moles of a pure white colour in a trap in the garden at Relig. Can the severe frost have changed the coat of these "miners of the earth," as it transforms the plumage of the fowls of the air? GRANT has got two of the Moles stuffed, to preserve as curiosities.—*Inverness Courier, as quoted in the Morning Chronicle, March* 12, 1838, *communicated by Peter Rylands, Esq.*

THE FIRST SWALLOW SEEN NEAR WORCESTER IN 1838.—On Monday last, the 16th, I saw the first and only Swallow that has met my view this bleak season. At about four, p. m., there was a most violent storm of snow from the N.W., lasting nearly an hour, and as I was watching its conclusion from my window, to my pleasure and surprise a lone Swallow appeared struggling with the storm, and making head as it best could against the driving snow-flakes. It remained long enough to enable me to be certain of it, and then disappeared, still progressing northward.—EDWIN LEES, *Dryadville Cottage, near Worcester, April* 20, 1838, *in a letter to Neville Wood, Esq.*

BIRDS, ETC., NOTICED IN APRIL, 1838.—We have lost all our Thrushes from the late hard winter.—The Nightingale and Redstart visited us on the 13th of this month; and a single Swallow is seen flying about. The 13th was very cold, with a strong wind, but the Nightingale was in full song, having secured to himself a sheltered situation.—On the same day I saw from twenty to thirty Porpoises [*Delphinus phocæna.*—ED.] in the Medway as high as Halling, about five miles above Rochester-bridge. They were exceedingly active, and in full pursuit of their prey, which, no doubt, had led them so far from the sea.—W. H. BENSTED, *Maidstone, Kent, April* 23, 1838.

HARMLESS NATURE OF THE SLOW-WORM.—I was not aware, until I had seen Mr. BELL's beautiful number of the *British Reptiles*, that the Slow-worm was so inoffensive. I have since met with several, and had no hesitation in handling them. I find them perfectly harmless, not showing the least disposition to resent your liberties. What a groundless prejudice exists against this poor innoxious being! Fortunately, its colour tends much to its preservation, for when coiled up upon a sunny bank it has considerable resemblance to a Hazel-root grown above the surface of the ground, and would by most persons be passed unobserved. I find that when placed on a dry foot-path free from Grass, it experiences great difficulty in progressing forward.—J. D. SALMON, *Godalming, Surrey, April* 16, 1838.

WHITE CROW.—We have seen an extraordinary specimen of the Crow tribe, which was shot at Rossie (Fifeshire) on the 9th instant. The wings and tail

are of a pure white, the rest of the bird of a beautiful French black. It has been presented to the Fifeshire Literary, Scientific, and Antiquarian Society. For some years past it has been observed in the neighbourhood of Rossie, but all attempts to get within shot of it proved abortive till the present severe storm rendered it less cautious.—*Fifeshire Journal, Feb.* 15, 1838, *communicated by Mr. Henry Buist, Law Park, near St. Andrews.*

MANNA.—This is believed to be an insect secretion, and collected from a shrub called Gavan, two feet high, bearing a resemblance to the Broom. It is collected in cloths spread beneath them at night, and it wears the form of large crystal drops of dew, such as are seen on plants in England early in the morning. It is found near Mount Sinai, and regarded with peculiar interest, in consequence of its connection with one of the most striking events recorded in Scripture. It falls during the heat of the day, is collected early in the morning, and after straining it through cloths, it is placed in skins and gourds: a considerable quantity is consumed by themselves, a portion is sent to Cairo, and the monks of Mount Sinai retail it to pilgrims, who receive it with much reverence as an incontestible proof of the event to which it refers. It is held as a luxury, and used for all the purposes of honey, and when taken in any large quantity, proves a mild laxative.—WELLSTEAD'S *Travels in Arabia.*

IMPORTANT ARTICLE OF FOOD FOR HORSES, DOGS, ETC.—When the duty on Sago was two guineas per cwt., and the import price from two to six guineas in addition, it was merely used as a delicacy, and as food for invalids. Of late the duty having been reduced to one shilling per cwt., and the import price from ten to seventeen shillings, it costs only half the price of Carolina rice, goes twice as far, and is very superior. As part substitute for milk in feeding calves, it is found very valuable: the method of using it is to sprinkle one pint of pearl sago into three quarts of boiling water on the fire, keep stirring, and in less than ten minutes you have a strong jelly, which, mixed with the same quantity of milk, is found to be a saving of half the milk, and the calves do better with it. Several gentlemen are now feeding their greyhounds upon it, boiled as above, then poured over biscuit or bread, instead of broth or jelly made from meat, and find it very superior, saving three-fourths of both expense and trouble, at the same time keeping their greyhounds in much better condition.—To those who keep packs of hounds this will be found a most important discovery. One of the largest Horse proprietors in the kingdom is using it as food for them with great satisfaction.—*Cheltenham Chronicle, April* 19, 1838, *communicated by Peter Rylands, Esq., Bewsey House, Warrington.*

DEATH OF A VALUABLE BLACK TIGRESS.—WOMBWELL'S Menagerie left this town on Friday last. Previous to its departure it sustained a serious loss by the death of a black tigress, which died while giving birth to three still-born cubs.

The animal was said to have been worth 600 guineas.—*Taunton Courier, April* 18, 1838.

Extraordinary Lamb.—On the farm occupied by Mr. Read, of Okers, may be seen a lamb with six legs. The additional fore-leg is quite separate from the other and perfect in its shape, having a distinct blade-bone, and the same length as the others. What renders this *lusus Naturæ* the more extraordinary is, that it continues quite healthy, and is as strong as those unencumbered with such superfluities.—*Preston Chronicle, April* 14, 1838.

Further News of the Bonite.—M. de Blainville has received further news of the *Bonite*, in a letter addressed to him from the Isle de Bourbon, by M Cydoux, and dated July, 1837. From the statements made by this naturalist, it would appear that, notwithstanding the shortness of the various sojourns of the *Bonite*, an ample harvest in Natural History has been gathered. Several of the animals are living, and intended for the menagerie of the *Jardin des Plantes*. More than 1,000 birds have been collected, many new reptiles, 200 species of fishes, most of which were found near the Sandwich Islands and in the Chinese seas. But the number of Mollusca exceeds all the rest. The causes of the phosphorescence of the sea have been carefully investigated, and constant experiments made on the temperature of the human body under divers circumstances.—*Athenæum, March* 17, 1838.

Flight of Locusts.—A correspondent of the *Calcutta Courier*, in a letter dated Benares, Nov. 28, says:—" A remarkable flight of Locusts passed over this district a few days ago, and left behind them a scene of desolation pitiful to behold: the oldest inhabitants declare they never before witnessed such a flight of devouring things, and from the bottom of their hearts hope they never will again. The flight appeared to come from the east, and in the distance resembled a column of smoke; but, from such information as I can gather, it does not appear that the column, in its approach to this devoted district, committed any great devastation; but when the whole flight had fairly settled down upon the country, then commenced the work of destruction; and you will be astonished, Sir, when I tell you, that they ate up not only vegetables, but every *living thing*—Sheep, Fowls, kids—nothing escaped. A mournful silence prevails over the land, and is only broken by the discordant screech of a wild Parrot, or the dismal croak of a Raven contemplating the desolation around."—*Asiatic Journal.*

Invertebrata of the Coast of Norway.—A residence of several years at Bergen, in Norway, has enabled M. Saars to obtain some new results concerning invertebrate animals. Among the *Mollusca*, M. Saars has found that several of the *Nudibranchiæ*, which are remarkable for having no shell, possess one while in an embryo state, and even some time after birth; it is external, like the Nautilus in shape, thin, horny, and transparent. The genera, he has observed, are *Eolidia*,

Doris, and *Tritonia*, which in this state differ from the adult species in form. M. SAARS has found three new species in the genus *Spio* of OTHO FABRICIUS, and thinks that this hitherto misunderstood group should be referred to the Nereids. The genus *Ophelia* he believes to have been described in an inverse sense by the learned naturalist M. SAVIGNY, and that it also belongs to the Nereids. M. SAARS has also found a new species of Apodal Worm on the branchiæ of *Lampris guttatus*, and an unpublished species in the stomach of a Beroë. Among the zoophytes, M. SAARS says that the *Asteriæ*, when first hatched, differ in form from the adult animals. The singular animal before designated by him as the *Strobila*, proves to be a young *Medusa*. The coasts of Bergen present many new and singular genera, and, although so far north, are remarkably rich in marine animals, several having been found there which have been hitherto seen only in warmer regions. Surely our naturalists on the opposite shores of Scotland have the same opportunities as M. SAARS; and might enlighten us concerning this extraordinary part of creation if they were sufficiently encouraged, and the expense of publishing could be defrayed for those who have other objects to which their incomes must be devoted.—*Athenæum*, *April* 14, 1838.

ORGANIC CHANGES IN NATURE.—The sluggish Cow pastures in the cavity of the valley; the bounding Sheep on the declivity of the hill; the scrambling Goat browses among the shrubs of the rock; the Duck feeds on the water plants of the river; the hen, with attentive eye, picks up every grain that is scattered and lost in the field; the Pigeon, of rapid wing, collects a similar tribute from the refuse of the grove; and the frugal Bee turns to account even the small dust on the flower. There is no corner of the earth where the whole vegetable crop may not be reaped: those plants which are rejected by one, are a delicacy to another; and even among the finny tribes contribute to their fatness. The Hog devours the Horse-tail and Henbane; the Goat the Thistle and the Hemlock. All return in the evening to the habitations of Man, with murmurs, with bleatings, with cries of joy, bringing back to him the delicious tributes of innumerable plants, transformed, by a process the most inconceivable, into honey, milk, butter, eggs, and cream.—ST. PIERRE.

NEW ANIMALS.—Two new genera of Mammalia have been found in the East Indies, which border upon the *Paradoxurus*; one, called the *Hemigalus*, seems to connect the Genets to the above animal, and the other, under the name of *Ambliodon*, approaches these two and the Civet; in consequence of which, MM. DE BLAINVILLE and ISIDORE GEOFFROY ST. HILAIRE propose to form a family, as follows:—

Family *Hemigalidæ*.	Genus Civet.
	—— Genet.
	—— Hemigalus.

Family Hemigalidæ. { Genus Paradoxurus. / —— Ambliodon.

These have been known since 1814, but M. Jourdan, of Ligon, has recently examined them in the museum of that place, the results of which we now give. —*Athenæum, as quoted in the Cheltenham Chronicle, April* 19, 1838, *communicated by Peter Rylands, Esq.*

Mode of repelling the Wolf.—A few days ago, a boy ten years old, was gathering sticks in a wood near Sauqueville, in the Seine Inférieure, when he observed a she Wolf carry one of her cubs in her mouth into some bushes, and hide it. As soon as the animal had departed, the boy went and took the cub, but the mother heard him and returned upon him. The bold boy, instead of being intimidated, made a stand, and drew his knife, which he flourished in the eyes of the assailant, who, either from fear, or, which is more probable, from care of her remaining young ones, retreated and suffered her antagonist to carry off the prize. For this trait of courage the mayor of his commune has given him a reward of 30fr.—*Bath Post, April* 28, 1838.

Arrow Head.—The head of an arrow, made of iron, and from its singular shape appearing to have belonged to some of the savage tribes of Africa, has been found in the body of an Eagle which was killed in Laconia.—*Athenæum, quoted in Chelt. Chron., Ap.* 19, 1838, *communicated by P. Rylands, Esq.*

BOTANY.

Numerical Estimate of the British Flora.—Having occasion to make an estimate of the British Flora, in connection with a paper which I am preparing for our Natural History Society, it has occurred to me that it might be both useful and interesting to the readers of *The Naturalist.* The Phænogamous plants are taken from the *Flora of Berwick*, as quoted in Mr. Watson's *Geographical Distribution af British Plants*; the Ferns and their allies from Mr. Francis's work, and the remaining orders from the second volume of Sir W. J. Hooker's *British Flora.* Of course the latter orders are not so complete or numerous as they will be when the various naturalists who have been investigating those tribes, since the publication of the last-mentioned work, shall have made known their discoveries. I believe that the Rev. M. J. Berkeley has published descriptions of some new genera and species of Fungi in the *Magazine of Zoology and Botany* which I have not included in this estimate.

Polypodiaceæ, 35; *Gleicheniaceæ*, 3; *Osmundaceæ*, 1; *Ophioglossiaceæ*, 2; *Lycopodiaceæ*, 7; *Marsileaceæ*, 1; *Equisetaceæ*, 8; *Musci*, 309; *Hepaticæ*, 93; *Lichenes*, 420; *Characeæ**, 8; *Algæ*, 516; *Fungi*†, 1,383. The great division

* This has most probably been included in the estimate of phænogamous plants.

† *Agaricus* alone contains 333 species; *Peziza* has 106; and *Sphæria* 201.

Dicotyledones contains 1,158 species; and *Monocotyledones*, 359. The total number of British plants, as estimated above, is, therefore, 4,303.—T. B. Hall, *Woodside, Liverpool, April* 4, 1838.

Sea Kale Beet, or Silver Beet.—This plant is totally different from the White Beet, and is of recent introduction. It is entitled, by its wholesomeness and delicacy, as well as by its amazing produce and facility of cultivation, to a portion of every domestic garden. Unlike the Mangel-wurzel and Red Beet, which are of the same family, this plant has its produce above ground, the root being small and unimportant. The whole of the leaf is used. The leaf-stalk, which is of an ivory whiteness, is separated from the green part, and boiled as Sea Kale, for which it is an excellent substitute, and whence its name; the remaining part of the leaf, when boiled, can hardly be distinguished from the finest Spinach; and, having the same virtues in a high degree, has been recommended by medical men as purifying and wholesome. It has besides this advantage, that one sowing, whatever be the season, will yield an abundant supply every day for at least six months. The great difficulty in the growth of summer Spinach is to prevent its running up to seed. This plant being biennial, does not flower till the second year, by which much useless labour and expense, incident to the growth of the Common Spinach, are prevented. Early in April procure one ounce of seed for a bed of the richest soil, 30 feet by 6 feet, make holes 1½ inch deep, and one foot apart, in quincunx order; into each put three or four seeds, and if more than one come up, withdraw all except the finest plant. About the first week in June the leaves will be from two to three feet in length; they may then be broken off close to the root for use.—*Gardener's Gazette, May* 5, 1838, *communicated by Peter Rylands, Esq.*

Effect of Carbonic Acid on Vegetation.—It is stated by M. Traviranus, in his *Physiologie Végétale*, that vegetation is not so active near springs where carbonic acid is disengaged, but M. Schleiden has proved to the contrary. According to the latter, the numerous springs in the valley of Göttingen contain a great quantity of disengaged carbonic acid gas, and some carbonate of lime in solution, whilst the vegetation of their waters, and on their sides, is always very vigorous, and more advanced in spring and prolonged in autumn than in other situations. Amongst the plants growing in the water, was *Sium angustifolium*; and among those growing on the sides of the springs, were *Ranunculus lanuginosus*, the Pilewort, the Marsh Marigold, and *Primula elatior*. From all these facts it appears that carbonic acid, either when disengaged or absorbed by water, exerts a beneficial effect upon vegetation.—*Athenæum, April* 14, 1838.

Importance of Azote to Plants.—It is generally supposed that the alimentary substances derived from the vegetable kingdom greatly owe their nutritious properties to the azote which they contain. M. Gay Lussac has recently

detected it in a great many seeds, and M. Boussingault, in his late experiments, has found it to exist in large proportions. Vetches and Lentils furnish from 4 to 5 per cent., and the seeds of Trefoil 7 per cent.—*Mining Journal, April* 28, 1838.

Progress of Vegetable Life.—First, upon the burning sand, or naked rock, the simplest structure of vegetable life, the Lichen, almost invisible to the eye, fixes itself, blown possibly by the breeze. Its generation is scarcely understood—it boasts no flowers which require time for their development, or food for their secretion. They struggle through their ephemeral existence either upon the confines of eternal snow, or upon the scorching regions of the torrid zone; they fulfil the general law of Nature—they die, but in their death are the harbingers of life; they decompose; the particles of which they are formed unite with the oxygen of the air; an acid is the result, which eats its way into the crevices of the rock, or insinuates itself amid the sand, when its other particles form new combinations, and, burying themselves, become a first layer of vegetable mould; cracks and crevices thus are formed, in which moisture is deposited; these become enlarged, either by the expansion produced by heat, or by frost; the granite mass is burst asunder, or slow disintegration occurs. In the thin stratum of mould a tribe a little higher in the scale of vegetable life is developed, probably some elegantly formed Moss, which bears a miniature resemblance to the trees and shrubs; these, too, run through their remains for the birth-place of some more perfect plants, such as the Grasses, the Saxifrages, the Wormwood, and plants with small leaves and low slender stems. The vegetable mould now deepens, generation succeeds to generation, plants of more complex structure, of a higher stature, such as shrubs and bushes, begin to rise upon the rock, or the sand, now no longer an inhospitable mass; at last the loftiest monarchs of the forest are developed, and spread over an immense surface, for perchance a single seed, wafted by the wind, borne by some bird, washed by some flood, or swallowed by some animal, and thus prepared for germination, is the means by which new generation bursts into birth, and changes the face of Nature. There is an uninterrupted circle of events on which the preservation and the gradual improvement of all the productions of Nature hangs, and there is an endless source of inquiry for Man.—Dr. Sigmond.

The Cedar Mountains of South Africa.—They are a fine primitive range, the peaks of which rise from 1,600 to 5,000 feet above the sea, and have a very picturesque outline. The vallies between the hills are rich in a dark-coloured vegetable mould, which is exceedingly productive. Corn, tobacco, and some wine, are here produced; whilst there is a constant and abundant supply of water, which is more or less chalybeate. I was particularly interested about the Cedar-trees, "the glories of Lebanon," which formerly covered this beautiful

range of mountains, and which in part still do so. They occupy ravines in the higher parts of the range, perhaps as high as 3,000 feet, and one cut down in 1836, measured 36 feet in girth, whilst 1,000 feet of plank were sawn out of its giant arms. No care has hitherto been taken of these valuable trees; the farmers, the Bastards, and Hottentots, living in the neighbourhood, cut them down without leave or license, and burn the Grass to improve the pasture, by which many old trees, and thousands of young plants, are annually consumed. As the Cedar-trees might, if preserved, become of great advantage to the colony generally, I represented, in the proper quarter, the manner in which they are constantly and wantonly destroyed; and it is to be hoped that means will be taken for preventing the future waste of that most valuable and imperishable timber with which the temple of SOLOMON was built. There are many Boschman caves in the Cedar mountains; they are generally at some height, vary from 300 to 1,000 feet above the valley, and are not of any great depth, say 30 or 40 feet, but they are very interesting, as containing the drawings in ochre of a wild people who have for some years disappeared in this locality. In one cave there is a spirited representation of a combat with bows and arrows; and in another, a flock of large-tailed Sheep and lambs are accurately delineated.—*Transactions of the Royal Geographical Society.*

GEOLOGY.

FOSSIL SHELLS ON THE WESTERN RAILWAY.—A vein of fossil shells has been met with by the labourers at Sonning-Hill, on the Great Western line, being the first yet discovered; it was found 21 feet beneath the surface of the old London-road, in the gravel. This vein was very thin, and very similar in appearance, and description of shell, to the marine deposits at Woodley, Earley, and the neighbourhood of Bob's Mount.—*Reading Mercury.*

REVIEWS OF NEW PUBLICATIONS.

A Treatise on Geology; forming the Article under that head in the Seventh Edition of the "*Encyclopædia Britannica.*" By JOHN PHILLIPS, F.R.S., F.G.S., Prof. of Geol. in King's Coll., London, &c. &c. Edinburgh: *A. and C. Black,* 1837. Demy 8vo. pp. 295.

WE have already (pp. 112—14) put our readers in possession of our opinions respecting the proper foundation for the science of Geology, and it will, therefore, be unnecessary to repeat them here, except so far as may be called for by passages which have occurred to us in the perural of Professor PHILLIPS's treatise.

The following extract respecting the rational mode of inquiry is excellent:—

"The laws of Nature are constant, but so adjusted to the material world that the effects they produce are proportioned to quantity and kind of matter, situation and direction of action, and other circumstances. A precise knowledge of the effects, and a correct view of all the agencies concerned, will lead us to the determination of the conditions under which the laws operated. In no other way than this has any one of the problems of organic and inorganic Nature, as we now behold her, been solved; no other process can possibly lead to real knowledge of the prior conditions of the globe. Geology can only pretend to the rank of science in proportion as it proceeds upon the principles of the Inductive Philosophy, and is aided by the advance of collateral inquiries. * * * Born in our own days,—based on modern observations,—interpreted by modern philosophy,—why should we seek rational Geology in the monstrous systems of Astronomy and Cosmogony which once satisfied Greece and Egypt? Why attempt the vain task of tracing the various errors of those writers of later days, who, knowing nothing of chemical and vital laws, and little of mechanical science, proposed hypotheses instead of collecting facts, and referred phenomena, which they had not correctly observed, to forces which they had never truly ascertained; resigned the beautiful monuments of ancient life, the fossil remains of animals and plants, to a plastic force of Nature, and attributed the regular and orderly structure of our planet to a general destruction and ruin of an earlier sphere?"—p. 2.

In another chapter it is satisfactorily demonstrated that the average temperature of the whole earth is on the decrease—a fact which has been made the basis of somewhat unwarrantable conclusions. The trifling difference alluded to would certainly not account for the quondam growth of tropical plants in even those portions of the world now termed temperate—much less where the same order of vegetation flourished in the polar regions.

Mr. Phillips, as will already have been anticipated, makes no reference to the mosaic writings in support of his arguments. Had he done so, he must either have been no geologist at all, or have sacrificed truth by twisting acknowledged facts so as to suit the traditional records of the Scriptures. Let any impartial and competent person, for instance, read the mosaic account of the creation of the world and the geological view of the case, attentively, and let him then believe either one or the other, but not both. In order to render the point in dispute clear to the student, with a view of throwing open the arena, so as to allow all to judge the correctness of our views, it will be necessary to mention a few of the leading and generally-acknowledged principles of Geology.

The crust of the earth consists of stratified and unstratified rocks, the former being subaqueous deposits, and the latter—the crystalline or other unstratified rocks—being of igneous origin. The world is supposed to have been originally filled with gas, from which every variety of matter has proceeded; but the truth or falsity of this is at present of little importance. Stratified rocks are divided into primary, secondary, tertiary, and supratertiary. The primary strata rest on unstratified granitic rocks, which form the limits to our investigations in the bowels of the earth. On the primary strata no organic remains are found. Superimposed upon the primary strata are those termed secondary, being

siliceous, argillaceous, or calcareous, and containing some organic remains.—Lastly, the uppermost layer is formed of the tertiary and supratertiary deposits, in which the vast mass of fossil remains occur. Whether the duration of time occupied by the formation of these various strata will ever be ascertained, remains doubtful; but at present we have no means of successfully comparing geological and historical periods. Nor can the various orders of strata be accurately defined. In Nature's plans we find no abrupt terminations: every thing is so blended as to form one beautiful and harmonious whole. Our division of the crust of the globe is as artificial as the disposition of the animal and vegetable kingdoms into orders, tribes, genera, &c., and serves the same purpose, viz., that of assisting our minds to seize and recollect the endless varieties of form and structure occurring in the strata. We commonly find that strata lie parallel to each other, but remarkable exceptions occur, in their meeting at various angles of incidence, or even crossing each other. Thus much, however, *is* known, namely, that the formation of the strata by sediment from water must have occupied countless ages—a period before which the few thousands of years constituting the history of Man fall into perfect insignificance.

Since we discover no organic remains in the primary strata—and of course none occur in the granitic formation on which they lie—and, as compared with the tertiary, but few in the secondary, those few being, moreover, among the lowest marine plants, and animals, as *Conchifera*, *Mollusca*, zoophytes, &c., it follows, as an incontrovertible position, not only that the world existed a fearful time without the presence of anything containing the "breath of life," but that long ages rolled along between the period when the lowest vegetables and animals opened their existence and the time when Man first entered the world. Taking the subaqueous origin of stratified rocks for our basis, this admits of no doubt. Thus, the Snowdon Rocks of the primary strata are 3,000 feet thick in Cumberland. The deposition of that single formation, it is certain, must have occupied a number of ages which it requires powerful nerves to contemplate. But before this the granitic rocks below the primary strata had to be formed, and subsequently the massy depositions lying above and below the Snowdon Rocks, to which we have alluded by way of example. All this time not a creature breathed, not a footstep ever disturbed the formations, and when at length low forms of animal and vegetable life existed, it is certain that the lapse of ages was again necessary before the world, by a series of slow and gradual changes, was fitted for the reception of the "lords of the creation," the highest of God's mighty works.

Having now brought the reader to the desired point, let us briefly advert to the account of the creation contained in the first chapter of Genesis.

"In the beginning," we learn, "God created the heaven and the earth." When this "beginning" was, does not transpire: probably it was a few hours previous

to the first recorded day! At this period, however, the earth was without form and void. The labor of creation was thus disposed:—On the first day the distinction between light and darkness was formed; on the second the waters which were under the firmament were divided from those which were above the firmament; on the third dry land appeared; vegetables, likewise, were created, with powers of reproduction; on the fourth lights were established in the firmament to divide the day from the night, and to be "for signs and for seasons, and for days and years;" on the fifth appeared birds, and marine animals; and on the sixth land, animals and Man.

Our readers now have, in juxtaposition, two accounts of the creation as opposite and as contradictory as can be well conceived. But we must here inquire, are you a geologist, or are you not?—a puzzling question, truly, for those whose veneration for authority triumphs over their reason, but one for which the more plausible of even this class will not fail to find a ready reply, in the assertion that "day" in the Bible is a mistranslation for "age" or "period." We fully believe that "day" is a correct version of the Hebrew word. But let us suppose, for the sake of argument, that we are mistaken. It appears, then, that so long as the mosaic records remained undisturbed by geological *facts* and *inferences*, they were not only considered unimpeachable in their correctness, but the hardy lover of truth who should venture to impugn their accuracy was denounced, with *christian* zeal, as an Infidel—a name, as frequently applied, honourable in the extreme; but no sooner are the facts produced, than this or some other equally mean subterfuge is conjured up to assist the decaying cause! Thus, whether it be days or thousands of years, matters not; it *must* be found correct if published under authority.

By the mosaic account, moreover, we are led to infer that matter, both organic and inorganic, was created by a direct fiat of the Almighty. Here again the Bible and Science are at issue, since the whole course of our researches in the latter study tends to point out that the world has ever been governed by fixed and immutable laws; that the world "in the beginning" and the laws are of God's ordainment, and that only thus far the Creator interferes with the progress of the earth and its countless inhabitants. We have related the manner in which, as geologists, we should explain the deposition of the earth's crust. The creation of Man and other animals is far from being equally clear, and in fact Science has hitherto proved unable to grapple with the point. But neither, on the one hand, is this cause for dismay, nor, on the other, can it induce the rational geologist to adopt, even temporarily, a view alike opposed to facts and to reason.

Lastly, prior to quitting this highly interesting question, let us briefly advert to a circumstance tending to cast doubt upon the accuracy of the first chapter of Genesis, and thereby supporting our argument. On the first day we are told

(v. 3) that "there was light." Yet on the fourth it appears that it is necessary to re-create light, by establishing "lights in the firmament." We should be glad to know how there could have been "light" prior to the existence of "lights in the firmament." The actual process of creation infinitely surpassed the idea conveyed by the mosaic description, or we are greatly mistaken. Before concluding, we shall probably return to the above question, but must now proceed to offer a few remarks on the *Treatise* before us.

At p. 118 our author briefly discusses the circumstances supposed to have favoured the growth of the immense mass of vegetation imbedded in the Coal formation. The tropical nature of the plants suggests the hypothesis—otherwise probable—that the climate of England was formerly considerably warmer than at present. In fact the temperature of the entire globe would seem to have been constantly on the decrease, and the diminution, however slow, would in course of time attain a considerable amount. BRONGNIART supposes that the air in by-gone ages contained abundance of carbonic acid gas, and was thus more calculated than at present to favour the growth of such vast and dense forests as must at that period have encumbered the then limited portions of land.

Professor PHILLIPS states that, drawing a line through Cheshire and Derbyshire, it is only on the western side of the boundary that plants have been found in Red Sandstone, near Liverpool and Manchester, referring in the former case to LINDLEY and HUTTON's admirable *Fossil Flora*, the testimony of which has in this case, we believe, been questioned. A supposed fossil has recently been discovered in Cheshire in the Red Sandstone formation; but as some obscurity hangs over the fine specimen alluded to, further detail on the subject would here be out of place.

Those who would account for all phenomena on the score of a universal deluge will do well to peruse our author's pertinent remarks at p. 146. Geology unquestionably favours the theory of a partial, though probably not of a universal, deluge. MOSES affords us no assistance in this inquiry, for the scriptural version is silent respecting the extent of the inundation. How NOAH contrived to introduce the number of animals requisite to fulfil the desired purpose into his limited ark, might form a subject for separate investigation, and is well calculated to stagger the inquiring reader, unless, indeed, the question be settled by the very philosophical mode of affirming that "cubit" is assuredly a mistranslation for "furlong"!

As regards the rule that peculiar characteristic forms always occur in certain rocks, we must bring modern Zoology and Botany to our assistance. Now, only a small proportion of the animals found in Europe are met with on the other side the Atlantic, and *vice versâ*. Quite a different kind of catalogue, again, is that of Africa or New Holland. The generalization respecting characteristic forms being found in certain rocks, can, therefore, only apply to the various zoological districts. Within the limits of each of these, peculiar forms may be found in

certain rocks, but the geologist must be prepared to meet with a different order of animal and vegetable remains *extra limites*, since each district differs from the other in many important particulars.

Our author places the probable appearance of Man in the world somewhere in the supracretaceous period; but, with the requisite caution ever present in the rational geologist, declines pointing to *what* part. He "cannot undertake to decide so important a problem upon the mere evidence of the *absence of human remains* from tertiary deposits, because such negative applies only to the European and North-American tertiaries, none other being explored." It is, therefore, not for us to decide that human remains will not be found in the tertiary deposits of some other portion of the globe. "Or," continues Prof. P., "if never in European regions this result should arrive, who is to assure us that, in countries more early peopled than these 'far western isles,' neither lakes nor estuaries of the tertiary era received and preserved some remains of Man, or traces of his works?" —p. 193.

It is inferred that bones have entered the fissures and caves in which they are found in one of the three following modes:—1. Some of the caves were occupied by predaceous animals; 2. Quadrupedal reliquiæ were drifted into other caves and fissures by water; 3. Other caves, again, communicating with the surface, have received the bodies of quadrupeds which fell into them, or their bones removed from small distances (p. 219). For several interesting instances of these modes of imbedding bones we must refer our readers to the subsequent pages of the work under notice.

The close connexion between earthquakes and volcanoes is very generally admitted, and Mr. Phillips adds that "it is also capable of sufficient proof that earthquakes generally precede volcanic eruptions." Modern disturbances, however, sink into insignificance when compared with the awful eruptions which in former cycles must have taken place to form the various "faults," and the contortions of strata causing the undulation of surface constituting the immense variety of hill and dale, mountain and valley, and their concomitant geological basins. The ordinary effect of an earthquake is displacement of the solid mass of the ground, and violent agitation of the liquid parts (p. 244); and in recent times its effect is merely to produce a yawning of the ground, or a slight elevation of certain parts. But this is no argument against the volcanic origin of mountains; since volcanic eruptions have probably been decreasing in vigour ever since the beginning of the world.

"In corroboration of a *cooling globe*," says our author, "we might here quote the phenomena of ancient organic life, which certainly agree with it, so far as to show that vegetation of a tropical character, corals, and other zoophyta, Crocodiles and other reptiles analogous to the animals of hot climates, formerly inhabited the land and sea near the polar circles; and indicate that the surface of these now cold zones was then of a temperature explicable only by a greater heating influence communicated from within the earth."—p. 284.

The explanation of this vast alteration in climate, from the ardent sun of a tropical climate to the deadly cold of the polar regions, is, however, puzzling in the extreme.

Having thus briefly explained a few of the more important laws propounded by Geology, and discussed other points suggested by a perusal of Professor PHILLIPS's book, we shall proceed to comment upon the state of geological inquiry, and upon our individual opinions thereon.

Some persons will probably blame us for the opinions promulgated in the present article, and for the supposed blasphemy of questioning the accuracy of any part of the Scriptures. Were we, in reply, to advance that our views are in many respects similar to those fearlessly taught by *Reverend Professors*, we should err equally with our opponents in an overweening attachment to authority. We, however, make no plea of the kind: our only appeal is to *reason*—the noblest gift of God to Man. But reason, we are told, is impious when applied to the Scriptures; and equally impious is it to test the latter by an impartial observation of Nature—impious in the former case because the authors of the Bible were inspired, in the latter since our observation of Nature may freqently fail in accuracy, both as mere observation, and in its application.—Of the inspiration of the mosaic writings, we reply, we see no adequate proof, but rather the contrary, and therefore we are but discussing the writings of one whom we believe to have written as little directly inspired as any author of the present day. The account given by MOSES of the creation, *e.g.*, appears to us nothing more than a tradition: in no other way can we explain its numerous errors. The writers of the New Testament undoubtedly *were* inspired: that invaluable book every where abounds with indisputable testimony of the *inspiration of reason*. When it shall be *proved* that the authors of the Bible were directly inspired, then it will be time to accuse those of blasphemy who venture so far to outstrip the majority of Mankind as to venture to apply the test of reason and common sense to this as well as to other works. Thus, were we informed by one of the so-called "inspired writers" (Joshua, chap. x., v. 12) that, instead of the earth's moving round the sun so as to produce the alternate states of light and darkness, the contrary took place, should we believe him? Certainly not, any more than a really philosophic geologist would credit the mosaic account of the creation. When so much doubt hangs over the question of inspiration, it certainly appears the safest plan to submit every thing to the scrutiny of reason; and if the opponents of Science should eventually be convinced that they have been reverencing, as divine, works simply human, their position would be any thing but enviable.

The second question, respecting the impiousness of preferring observation of Nature to implicit reliance on the Bible, yet remains to be considered. Some persons seem to believe that the Bible is the only work of God, and that there

alone his attributes can be studied to advantage. Even granting, for the present, that the Scriptures are the work of God in the manner sometimes supposed, we fearlessly declare our firm conviction, that the study of Nature, in the most extended sense of the term, is not only the best but the sole method of attaining a true, though necessarily imperfect, knowledge of his wisdom and goodness. Every one acknowledges the world and all that therein is to be the mighty work of the one true God. Why then resort, for scientific information, to a source which may be, and probably is, incorrect, or at least which admits not of implicit reliance? The world is open before us, and we have the faculties requisite to discover, in a great measure, the nature of its architecture, and the endless instances of means to an end observed therein. Some writers are ever on the look-out for such "surprising instances," seeming perfectly astonished at the circumstance, and pointing it out to their benighted readers, apparently, as an unusual occurrence, whereas the real wonder would be the discovery of a fact of an opposite tendency. It is hardly necessary to observe—what must be in the knowledge of most persons—that such writers are far from being always among either the best or most "religious" men. Respecting the probable inaccuracy of natural-historical observation, and the various application of which it admits, surely the objection applies, with ten-fold force, to the perusal of the scriptures; for not only is our "authorised translation" notoriously incorrect in many places, but almost every passage in some chapters admits of half a dozen or more different versions.

Of the wisdom or piety of those who denounce as blasphemous the profound deductions of some of our most learned men from careful observation of the vast repository of God's undoubted work, we have but a low opinion. Men bred and nurtured in orthodoxy, or in the noxious influence of sectarian bigotry, and whose reason has ever been shackled by authority, are not those whom we should select as proper judges of truth in any shape. Commonly furnished but with the vicious morality of ancient classical writers, and by courses of "reading" in the Bible—which they have been taught to worship as the *ne plus ultra* of christian truth—and educated with the sole view, not of enabling them to judge respecting the relative advantages of the various sects, but of blinding them to the merits of everything save orthodoxy, shall they dare to compete with those eminent men so immeasurably their superiors in knowledge and true piety whose services to Mankind will consecrate their names in the memory of all succeeding ages—names which will be uttered with reverence when those of their opponents (once triumphant in the eyes of the world) shall have long ceased to be remembered? Shall a man suffer for his humble but profound and ineffaceable attachment to the sublime works of that Almighty Being which can never be contemplated without improvement—never studied without advantage? Yes: thus it has ever been. The best men of all ages and all countries have, for the time, fallen martyrs to

their unalterable love of truth. But such a deplorable state of affairs, we confidently hope, will not, cannot last for ever. No: in the language of the prophet, "the knowledge of the Lord," through his works, will one day "cover the earth as the waters cover the sea." In that day men will no longer be persecuted for their opinions, or for the grievous offence of preferring the knowledge of the Lord obtained immediately from his works to that imparted, partially, if not incorrectly, by men altogether ignorant of science, or even of the very nature of scientific inquiry. Pitiable is the philosophy of those who teach that salvation is alone attainable by an empty belief in their creeds, and that all others shall "without doubt perish everlastingly." Vengeance is mine, saith the Lord; and shall frail mortals arrogate to themselves the right of judging their fellow-mortals? We believe they cannot do it with impunity. Be this, however, as it may, they have their reward.

In the discussion of this point, we wish it to be distinctly understood that we only so far object to the study of the Bible as relates to scientific inquiry, where its accuracy or otherwise may be mathematically proved. The invaluable code of morality imparted by the Sacred Volume will be the unerring guide and safeguard of Mankind as long as the world exists; and, when time shall be no more, and the precincts of eternity shall be open before us, then will men be happy or miserable in proportion as they have fulfilled or neglected its everlasting precepts. At that awful moment, or we are greatly deceived, no one will receive punishment for opinions honestly held—in other words, for the result of the exercise of the highest faculties: rather would those suffer who have permitted their talents to lie dormant: rather will those be unhappy whose words and faith have been fair, but whose *works* have been lamentably deficient.

It were unfair to conclude without a few observations on the execution of the *Treatise* which has given rise to these remarks. Its plan is lucid, the descriptions are wholly free from verbosity or confusion, and the spirit pervading the whole is excellent. Destitute of those factitious attractions commonly deemed requisite to render scientific works "popular," the subject and the manner in which Professor Phillips has treated it appear to us well calculated to ensure the attention of all classes of readers. Under these circumstances, we congratulate the public on the reappearance of the treatise, originally printed in the *Encyclopædia Britannica*, in the present portable form. It is embellished with two good engravings of Fingal's Cave.

14936 2

THE NATURALIST.

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SOME REMARKS ON SPECIFIC DISTINCTIONS.

By Peter Rylands, Esq.

At p. 20 of the second volume of *The Naturalist*, noticing the difficulty of testing the validity of certain presumed species of insects, I remarked that "should there be found specimens which vary in such a manner as to form a connecting link between the supposed species and the established one, the true value of the former is at once understood"—believing that, in such a case, it ought to be considered a mere variety. Mr. Blyth, doubting the correctness of this opinion, favoured the readers of *The Naturalist* (Vol. II., pp. 288, &c.) with some observations on the subject, the general tenor of which was sufficiently gratifying to me to induce a feeling of indifference to, if not forgetfulness of, the *cause* which led to their publication. After this long interval the subject would not have been recurred to on my part, did I not believe that good must result from a calm and candid discussion of the question at issue, and that it well merits further consideration.

Cuvier defined a *species* to be "the assemblage of individuals, descended one from the other, or from common parents, or from such as resemble them as strongly as they resemble each other;" and *varieties*, "the accidental subdivision of species."

Kirby and Spence remark that "a *species* is a natural object whose differences from those most nearly related to it had their origin when it came from the hands of its Creator; while those that characterize a *variety* have been produced since that event."

Notwithstanding these strict definitions, naturalists have long been puzzled to discover some certain diagnostic whereby a variety may be distinguished from a species. The authors last quoted (*Introduction to Entomology*, Vol. IV., p. 397) state that, "in general, where there is no difference in *form*, *appendages*, and *organs*, *proportions*, *sculpture*, and *larvæ;—colour* alone, especially in insects inhabiting the same district, only indicates a casual variety." Dr. Burmeister remarks (*Handbuch der Ent.*, p. 588) that "one important character which especially identifies the sub-species [or variety] with the species is, that they are fertile

together. This is a very definite character, and which is subject to no divarication." If the Doctor's position admitted of no divarication (which it does and greatly so), it could benefit us little, as the information necessary for the application of the test is, in the vast majority of cases, entirely deficient.

To pass on to the opinion given above, viz., that if two *presumed* species are *so connected together by intermediate varieties*, that *not a single perpetual* and *invariable* (however slight) *distinction can be discovered*, they must be considered *identical.* As the habits of many species have not been observed, and others present no difference whatever in this respect, the general marks of distinction are taken from the *structure*, *colour*, and *size.*

As examples of *closely-approximating yet distinct species*, I shall select some of those given in Mr. BLYTH's excellent paper on the Mealy Linnet (Vol. II., p. 453). Thus, for instance, we find that *Elanus melanopterus* (African species) and *E. dispar* (American sp.) approach each other so closely in *size* and *colour* as to be indistinguishable in these respects; but the former has the outer feather of the tail rather the longest, which in the latter species is more than half an inch shorter than the next. This peculiarity in the *structure* is *always present.* The Bullfinch (*Pyrrhula modularis ; P. vulgaris*, Auc.) is represented in Japan by a species from which it differs *very slightly* but *permanently* in the colour of a single feather. Almost as *slight*, though quite as *invariable* a peculiarity of colour forms the only point of distinction between *Budytes flava* and *B. neglecta* (*B. cyanocephala*, N. WOOD); *Motacilla alba*, LINN., and *M. maculosa*, (*M. Yarrellii*, GOULD); *Garrulus glandarius*, and the allied Jays of Asia-Minor and Japan; and between numerous others. Then again, *Pyrrhula modularis*, which agrees exactly in all points of *colour* and *structure* with the Great Bullfinch, is yet distinguishable by an *invariable* inferiority in *size.* In all the above instances—and numerous similar ones might readily be added—it will be noticed that there exists, *notwithstanding an approximation even to entire similarity in other respects, some peculiarity* which is *invariably* present in one species, and absent in the others; and the importance of which as a distinctive character is *never destroyed by intermediate modifications.* Consequently we find that such species are classed as distinct; and in many cases a diversity of habits, &c., fully warranting their being considered genuine species, has been observed.

On the contrary, let us examine one or two forms in which no single distinctive character is preserved through their various modifications. Take, for instance, *Pontia chariclea* of STEPHENS. The claims of this insect to rank as a species must, as in the preceding examples, be furnished by its *structure*, *colour*, or *size.* In the first particular it is exactly similar to *P. brassicæ*, and the differences observable in its *colour* and *size* are *entirely lost* in the *intermediate varieties. It does not, in fact, possess one constant distinctive characteristic.* The same

remarks will apply to *Pontia metra* (STEPH.); and in neither has there been observed any diversity of habits* which would warrant the separation of the former from *P. brassicæ*, and the latter from *P. rapæ*.

But Mr. BLYTH seems to think that intermediate forms such as these may have been produced by the admixture of races originally distinct. I cannot admit the probability of this being the case in a natural state; it appears, on the contrary, *highly improbable*. And although Mr. BLYTH's belief that the offspring of very nearly allied species might be fertile, *may* be correct, yet it ought to be remembered that the generality of alliances sufficiently close for this purpose, are of species inhabiting distinct geographical ranges, and which are therefore debarred by natural causes from thus intermingling; and that such closely-allied races, when inhabiting the same locality, "*manifest*" (to use Mr. B.'s own expression) "*no disposition to intermix and blend*, as is uniformly the case with even the most distant of true varieties." (Vol. II., p. 457.) It seems probable that, in order to preserve consistency and regularity throughout the animal kingdom, each species has implanted within it an aversion to interbreed with others, which only fails when the influence of natural causes is lost, and that of artificial ones substituted. And when such an intermixture does take place, "the highly curious physiological fact may be borne in mind—which possibly has for its object the continued separate existence of each primitive race—that very closely-allied species, and (as an apparent consequence of the same law) similar varieties, also, less frequently produce, on intermixture, offspring of blended character, than progeny resembling one or the other parent." (BLYTH, Vol. II., p. 457). These facts strongly militate against the possibility of any original races having become blended together. At all events, "*probandum est*," as Mr. BLYTH observes; and indeed there exists very slight foundation for the theory, which consequently ought not to be allowed any weight in discussing the present question.

Bewsey House, Warrington,
May 19, 1837.

A HISTORY OF THE NIGHTINGALE.†

BY EDWARD BLYTH,
Curator of the Ornithological Society.

THIS celebrated and handsome bird (notwithstanding the unobtrusiveness of its colour) is rather longer and more slender than a Robin, which it otherwise much resembles in its figure and proportions. Its colour is plain russet-brown above;

* The belief in the existence of a different period of appearance has, I think, been clearly proved to be erroneous; see Vol. II., pp. 128, 129.

† Read before the Ornithological Society, May 5, 1838, J. R. GOWEN, Esq., in the chair.

the tail more rufous; under parts, and obscure eye-streak, pale greyish-brown. The sexes are scarcely distinguishable; but the young have a terminal pale spot on each feather of the upper plumage, and the under parts are slightly edged with dusky. They moult once in the year, and the young acquire their adult dress previous to their departure in autumn, but retain their nestling primaries until the second renewal of their others.

In its systematic relations, the Nightingale may be considered as an ultimate ramification of the great Thrush genus, in a particular direction, an unbroken series of intermediate species ranging from the more characteristic Thrushes unto this noted songster. It is but distantly related to the Fauvets, and the other small insect-eating birds with which it is generally placed; and, excepting the small solitary Thrushes of North America, which display the gradation adverted to, I am aware of no genus approaching it so nearly as that of the Robin. The Nightingale and Robin have indeed been known to produce hybrids in a state of confinement.

It may be worth while here to remark, that the Robin also ranges in a series of birds that grade in another direction from the radiating genus of Thrushes. The division *Geocincla* of Mr. Gould includes the species that intervene. A contiguous section—*Petrocincla*—passes into the Redstarts and Wheatears, and the other equivalent divisions are comprehended under the term *Saxicolinæ*; all the members of which are little else than small-sized Rock-thrushes, and agree in possessing a mottled nestling plumage, as well as in many details of habit. They are chiefly birds of open unsheltered localities, which habitually perch, conspicuously, on the summits of objects; but the Nightingales, like those Thrushes from which they directly grade, are inhabitants of woodland districts, and rather shy of observation. Two species are recognized, the larger of which (a native of eastern Europe) is every way more Thrush-like than that of Britain, and has even an obscurely spotted breast. In one of the Nightingale-like Thrushes of North America, the breast-spots appear as if half obliterated; and in another of them the tail is rufous, as in the Nightingales.

Our renowned chorister arrives in the south of England about the middle of April, and departs for warmer climates in September, though a straggler is now and then seen in the following month. The poet Cowper addresses some stanzas "To the Nightingale, which the author heard singing on New Year's day, 1792"; and Mr. Newman, in the *Magazine of Natural History*, records that "On Dec. 12, either in 1823 or 1824," he "heard the Nightingale singing clearly and distinctly, although not very loudly, at Godalming, Surrey"; and he adds, that in the neighbourhood, he has "frequently seen the Nightingale in October, and once in November." In a state of captivity, this species commonly begins to sing about Christmas, sometimes so early as in November, and comes into full song

gradually in about three weeks: wherefore, if it ever do remain in this country through the whole winter, it is difficult to conceive how its melody should escape notice during the earlier months of the year; in the cage it certainly never sings more delightfully than at that period.

The male arrives ten days or a fortnight sooner than the other sex, and both immediately repair to the locality which they left the preceding autumn; travelling only by night, as the voice of the male is often heard, at intervals, for a whole day, and only for one day, in places which individuals pass in their progress northward. In autumn they also migrate solitarily, though the contrary has been asserted. It would be at variance with the whole tenour of the Nightingale's habits, and also of those of the birds to which it is most nearly allied, for it to assemble in small societies at any season. Not even the Robin is more quarrelsomely disposed towards others of its kind, than is this famed "leader of the vernal song." The Hon. and Rev. W. Herbert mentions that "a Nightingale, which had lived two years in a cage full of birds, and even suffered the common Wrens to jump and rub themselves on its back, instantly attacked, in the most violent manner, another Nightingale which was placed in the cage." All who are in the least familiar with the habits of this noted songster, must have frequently remarked the extreme jealousy of its disposition.

It retires in winter, in common with the rest of our summer visitants, to northern Africa, where M. Le Marie (as quoted by Montbeillard) heard them in full song. At Smyrna Mr. Strickland noticed their re-appearance on April 5; and Gilbert White, in his "Naturalist's Calendar," extends the period of their first arrival in Selborne, Hants, from April 1 to May 1; so that their return, throughout the extent of their breeding range, is probably nearly simultaneous; that is to say, they loose but little time on their passage. Each pair, in summer, appropriates a small district, attacking, with the utmost fury, any bird of their own species that trespass on their territory. In general, however, the Nightingale is rather a sedentary bird, habitually retiring from observation; and it puffs its plumage very much, even when hopping about, at which time the tail is mostly raised higher than the points of its wings. It is remarkably fond of bathing, and frequently soaks its plumage so completely as to fly with much difficulty.

Nightingales, like many other birds, dislike cold and especially windy weather, but seem to be quite indifferent about rain. Thus, in uncongenial seasons, their music is but little heard; but if the weather prove favourable they burst forth into loud song immediately on their arrival in the woods. It is then that they sing, habitually, with the greatest vigour; for the song slackens a little, and is delivered less frequently, after they have mated. Towards the close of May it becomes less and less frequent, till it ceases altogether; but it is continued for a rather longer period by night than by day. Notwithstanding all that has been

asserted to the contrary, the Nightingale is a frequent diurnal vocalist, insomuch that to one that may be heard singing during the night, at least a dozen may be remarked in the same locality by day, in places where they are numerous. They sing more frequently at midnight than in the evening; for at about eight or nine o'clock not a single Nightingale will perhaps be heard, when, an hour or two later, the woods resound with their music.

The surpassing song of the Nightingale is totally unlike that of every other British bird; and its characteristic trait is the brilliancy of its execution, the articulate manner in which it repeats the most inimitable passages, often with inconceivable rapidity. It is a bird

> "That crowds and hurries and precipitates
> With fast thick warble his delicious notes,
> As ever fearful that an April night
> Would be too short for him to utter forth
> His love chaunt, and disburthen his full soul
> Of all its music * * *
> * * * Far and near
> To wood and thicket over the wide grove
> They answer and provoke each others songs,*
> With skirmish and capricious passagings,
> And murmurs musical, and sweet 'jug, jug,'
> And one low piping sound more sweet than all,
> Stirring the air with such an harmony,
> That should you close your eyes you might almost
> Forget it was not day."
>
> COLERIDGE.

But the BARD OF AVON, availing himself of the acknowledged licence of a poet, affirms that

> "The Nightingale, if she should sing by day,
> When every Goose is cackling, would be thought
> No better a musician than the Wren."

And the Scottish ornithologist of America, ALEXANDER WILSON, seizes on this deprecatory passage in order to extol the Mocking-bird at the Nightingale's expense. It is in the day-time, however, according to my judgment, that the Nightingale is heard to the most advantage. He is the loudest songster of the wood, and one of which the notes, at once, arrest the attention over every other. That singular "low piping sound more sweet than all" takes a stranger to its song quite by surprise; he wonders what he hears; and the rapidly-delivered passage that follows perhaps first apprises him that the sound proceeded from a bird. Slow, plaintive, rising *in crescendo*, dwelt on till the listener pauses in astonishment,—again repeated in another key, even a third time,—how very different is this

* A conspicuous habit, in which this bird further resembles the Robin.

most peculiar lay from the inimitably rapid, and distinct, often long-continued repetition of a monosyllabic sound, that perhaps succeeds—rattled forth with truly marvellous perspicuity of utterance, and melody of tone. "One would hardly imagine," remarks MONTBEILLARD, "that so varied a song as that of the Nightingale is confined within a single octave; yet this is the result of the attentive observations of a man of taste (M. le Docteur RAYMOND). He remarked, indeed, some sharp tones which formed the double octave, and which were emitted like lightning; but this happened rarely, and when the bird by a powerful effort raised his voice to the octave."

In the first instance, I have observed that the song of the Nightingale surprises, sometimes, rather than pleases; but it rapidly improves in estimation. A writer in the *Court Journal*, however, who signs himself *Anti-Philomel*, is of a different opinion. "In point of fact," says this reviler, "there is nothing either sad or sentimental in the song of the Nightingale. It is an incessant tinkling, trilling, monotonous, yet laboured effort of execution; and, with the exception of the 'jug, jug, jug,' which occasionally interrupts the thin and *Rossinian* character of its strains, there is not a poetical note in its whole gamut. Philomel is the HENRIETTA SONTAG of the woods—unimpassioned, artificial, but miraculous in point of delicacy of execution; and the fact of her being a *night* vocalist, instead of establishing her claims to sentimentality,

'Most musical, most melancholy,'

proves only the self-conviction of the bird, that its strains are incompetent to vie with those of its fellow-choristers—or, perhaps, an invidious desire of distinction. The ancient apologue, of the Nightingale expiring in the successful effort of rivalship with the poet's lute, proves that it has even been suspected of a paltry and narrow jealousy of competition.

"Who," it is contended, "that has ever listened to the mellow vesper hymn of the Blackbird, or the Thrush-notes gushing in bursts of gladness from the heart of a Hawthorn-bush, but must acknowledge that there dwells more poetry in their music than in all the demi-semi-quavers of the 'plaintive Philomel.' What lover of poetical justice but longs to transpose the line of PETRARCH—

'E garrir Prague,—e pianger Filomele,'

and distribute the *garrizitura* (chatter) to the tinkling Nightingale?" Why, with every due appreciation of the undoubted merits of the two songsters appealed to, I have only to add, *De gustibus nil est disputandum.* I prefer the loud, cheering, animated burst of liquid melody of the gay Blackcap, to either the deep-toned warble of the one, or the discontinuous broken music of the other.

The lack of continuity is unquestionably the principal failing of the Nightin-

gale's stanzas; but he may sometimes be heard warbling most deliciously in a lower tone than usual, and without those frequent pauses of which we have some reason to complain. In common, however, with some other birds, and particularly the Blackcap and Reed Warbler, the Nightingale never sings so pertinaciously as when it instinctively thus endeavours to absorb the attention of an intruder near its nest. Thus, Mr. CONWAY narrates:—"I was diverted from my object by the melodies of a Nightingale almost close at my sides. The singing was in one continuous, incessant, and uninterrupted melody; there were none of those frequent breaks, which are so characteristic of the song of the Nightingale, when heard at a little distance; it was one incessant warble. I can hardly call it a warble either; it was an unceasing effort; so much so, that I stood perfectly astonished, and at a loss to conceive how it was possible for so small a creature to exert itself so mightily. I began, however, to think that the nest of the melodist could not be far off; and, as I had never yet seen the nest of the bird, I determined to watch him closely, in order to discover it. But I was nearly giving up the search as useless; for as soon as I entered the copse, no matter at what part I made my entrance, the warbler was at my side, delighting me with its melody, and hopping from spray to spray, and from bush to bush, and thus leading me the round of the wood at pleasure. When, however, all hope of finding the nest had nearly vanished, I fell in with it by pure accident; and I then discovered that the singing of the bird had always led me in a direction from the nest." The Blackcap, and common Thrush, however, will occasionally thus sing, even while sitting on the eggs, and so occasion the discovery of the object of their anxiety. But the Nightingale ordinarily pours forth his bewitching music at some distance from where his mate is incubating, whence this trait in his character is comparatively seldom witnessed. His song ceases about the period of the exclusion of the young, or early in June, but, as before stated, is continued somewhat longer by night than by day, as in the instance, likewise, of the Reed Warbler's hurried chirrups; and from this time a very plaintive cry (resembling the sound *hweep*), which is common to both sexes, together with their usual harsh croak, is reiterated on all occasions when they apprehend danger.

"The croaking of the Nightingale in June and the end of May," remarks Mr. KNAPP (the observant author of the deservedly popular *Journal of a Naturalist*), "is not occasioned by the loss of voice, but by a change of note—a change of object. His song ceases when his mate has hatched her brood; vigilance, anxiety, caution, now succeed to harmony, and his croak is the hush, the warning of danger or suspicion, to the infant charge and the mother bird." Now all this is wrong; for the Nightingale croaks at all seasons; and captive Nightingales, which have no nestlings to provide for, invariably discontinue singing at precisely the same period as the wild birds. They naturally breed once only in

the season—at least as a general rule; and the true cause of the cessation of their melody is very evident on dissection. Should the male bird, however, be deprived of his mate, he will *sometimes* (as proved by an experiment of MONTAGU) endeavour to attract another by resuming his strains; but I am disposed to regard this as an exception rather than the rule. I know, from direct observation in the case of the Robin, that birds do not always try to win a second mate when the first is destroyed; and the instance to which I allude is the more remarkable, as the death of the female happened early in April.

In ordinary circumstances, when the Nightingale is pouring forth his music, concealed in a bush, he will not suffer himself to be approached too near; and though he does not immediately fly, he ceases to sing, and signifies his displeasure by emitting the peculiar harsh croak already spoken of, and which resembles the sound *crr*, or *carre*, pronounced with a rolling of the r's; and if upon his repeating this three or four times, the intruder should not retire, he flits to another bush, where he immediately recommences his abrupt stanzas; yet if we advance gradually, and by slow degrees, so that he should not be startled (and he will oftentimes thus permit of a closer approach than the generality of singing birds), he will then sometimes shew himself; and warble loudly within a couple of yards of the spectator, when the considerable dilatation of his throat will be very obvious, and when it is impossible not to admire the lightness and elegance of his form and movements, particularly as shewn by the amazingly long hops which, with effortless ease, he takes from bough to bough.

The song-notes of the Nightingale are less innate than in the generality of singing birds, in consequence of which those individuals which are raised in captivity are far less musical than the birds which are captured wild in spring—that is, unless they are brought up under a wild-caught bird of their species. Mr. SWEET remarks, that "a young Nightingale is apt to catch all that it hears, and to be deficient of many of the ordinary notes of its species. I had one," he continues, "for three years, and it never sung a stave worth listening to; at length I turned it out [it may be presumed about the end of summer, when it had discontinued singing, for earlier in the season it would undoubtedly have proceeded northward], and it remained in the gardens round the house till it left the country in autumn; it returned to the same place the following spring, where I instantly recognized it by its bad song; and it continued in the neighbourhood all the summer, and bred up a nest of young ones."* This case will suffice to

* The individual observation of the author of *British Warblers* may doubtless be extended to the whole species, but we entirely disagree with Mr. BLYTH in his inference from the circumstance. We believe the song-notes of the Nightingale to be as innate as those of any other feathered chorister; the only difference being, in our opinion, in the relative development of the faculty of Imitation, which, exercised early, causes the bird to acquire strains which modify or wholly absorb its more natural melody.—ED.

intimate, what is familiar to all practical observers, that birds of passage return to their former place of abode; and it further incidentally hints that the superb song of a Nightingale is formed while the bird is young, and that it cannot afterwards be improved.

Mr. Sweet continues:—"A female that I had been keeping for six years, I also turned out along with him; this bird I kept four years, and it never attemped to sing; the fifth year it sang frequently, a pretty, soft, Nightingale's note. I have found this to be the case with several female birds; they do not sing till they become aged; but it is not an unexceptionable rule, as I have had a female Willow-wren that sung when quite young."—The father of Natural History, Aristotle, remarks, of the singing birds generally, that "some females sing like their males, as appears among Nightingales, but the female gives over song when she hatches." Lord Bacon, too, observes "that the males, among singing birds, are ever the *better* songsters;" which is as qualified a statement as that of Buffon, to the effect that "the females are much more silent than the males, song being *generally* withheld from them."—"In Nightingales," says Montbeillard, "as in other species, there are some females which enjoy certain prerogatives of the male, and particularly participate of his song. I saw a female of that sort which was tame; her warble resembled that of the male, yet was neither so full nor so varied; she retained it until spring, when, resuming the character of her sex, she exchanged it for the occupation of building her nest and laying her eggs, although she had no mate." Aldrovandus, however, in deducing lessons of morality from this bird, most gallantly observes that the female ought to be imitated in her silence by women, who, "in his time," on the contrary, were (I must not venture to translate it) "*loquaculæ, argutulæ, verbosæ, dicaculæ, linguaces, garrulæ, et arcanorum minimæ tenaces!!!*"—I have known an instance of a cage Song Thrush, a remarkably fine songster, which was accordingly always considered a male until it was two years old, when one morning an egg was found in its cage, and a day or two afterwards another. In some birds, as the Common Bullfinch, and Cardinal Grosbeak of North America, both sexes sing alike; but most generally, as in the instance of the common Linnet, the song of the female is weaker and less varied than that of the male.

Concerning the longevity of Nightingales, Bechstein remarks that "in confinement, after these birds have reached six years, they begin to sing less frequently, and with less brilliancy and ornament. A Nightingale," he adds, "may, by proper management, be kept in confinement fifteen years. I even know an instance of one attaining the age of twenty-five years in captivity."—It is therefore impossible that he can be correct in assigning so early a limit to the full powers of this splendid vocalist.

Mr. Salmon (*Naturalist*, Vol. II., p. 52) records an instance of a pair of

Nightingales breeding in captivity, some of the young of which were reared; and BECHSTEIN relates that—"It is said that a Nightingale and female Robin, turned loose into a room, will sometimes produce hybrids; but," he adds, "I have no experience on the subject." A friend of mine succeeded in pairing a Nightingale and Robin, which latter produced four eggs, but unluckily died, egg-bound, when about to produce a fifth. I regret that these were not deposited in the nest of some other species.

In the wild state, the nest of the Nightingale, which is extremely difficult to find, is most commonly placed on the ground, often against a bank, among the fallen leaves of which it is principally or wholly composed; sometimes, however, it is situate in a heap of faggots or Pea-sticks, on a low stump, or in the centre of a thick bush. Not uncommonly it is too frail to admit of removal; but, in general, it is not quite so loose; and I have seen some constructed of dead but undecayed Oak-leaves, stems, and a little Moss on the outside, which were tolerably compact, indeed very much so. Others are built exclusively of skeleton leaves, which usually (but not always) constitute the lining; and they appear to have been laid on wet, that they might adhere the better together. Occasionally a small quantity of Horse-hair is added to the lining. The eggs are from four to six in number (and not unfrequently these are not all hatched), of a dark greenish or brown colour, which is sometimes broken into small spots, commonly most numerous at the large end, which are of course darker on a lighter ground than when they are uniform; they vary considerably in size.

The young are hatched after a fortnight's incubation; and quit the nest very early, as is the case with most other ground-building birds, while those that incubate in holes, more particularly, remain much longer: both sexes warble to themselves, even before their tails are full grown; and the young females generally continue to do this, but in a weaker and more unconnected strain than the young males, till the following spring, when they gradually leave off *recording*, as this desultory mode of singing is termed by the *bird-fanciers*, while the notes of the male sex rapidly increase in volume and loudness. The cry of nestling Nightingales is particularly harsh and disagreeable.

In the Analysis of the Proceedings of the *Académie des Sciences pendant le Mois de Juin*, 1836, there is a letter from M. NERVAUX, in which he reports that he has seen a pair of Nightingales remove their eggs from the nest, when this was threatened to be inundated, and that the eggs, placed in a new nest, were afterwards hatched. How the removal of them was effected—a matter surely possessing its full share of interest—is not stated; but we may presume that the feet were the instruments of prehension.

That assiduous observer, the late Col. MONTAGU, has ascertained that the

young Nightingales are fed by their parents chiefly on small green caterpillars, probably, as Mr. SELBY suggests, those of a *Tenthredo*. The adult birds seek their subsistence mainly on the ground, among decaying leaves, hopping about like a Thrush or Robin, and feeding on insects of all descriptions, more particularly the larvæ of Beetles; in autumn they evince a partiality for Elder-berries, but are much less frugivorous than the different Fauvets; attacking only those smaller fruits and berries which they are able to pluck and swallow entire. When in confinement, they are easily kept on a mixture of bread and hard-boiled eggs, chopped up together; but the more insect-food is given to them the better, and if they can be brought to feed in part upon bread and milk—which they will not always do readily at first, though they afterwards become extremely fond of it—they will thrive and sing upon this mixed diet to perfection. Indeed, the principal art of keeping cage-birds healthy, conjoined with due attention to cleanliness, is to vary their food judiciously, or the digestive energies, as in ourselves, become soon impaired. All that is not salt, or pungent, which is brought to a dinner-table, will suit the appetites of the generality of insectivorous birds.

It remains only to offer a few remarks on the geographic distribution of the Nightingale, which appears to be confined to Europe and northern Africa. In Britain they only occur occasionally beyond the third meridian of western longitude, a line that cuts off Devonshire and Cornwall, Wales, Ireland, and the greater part of Scotland; while, on the Continent, they visit Denmark and even Sweden. From the facts I have learned relative to their absence or presence in particular districts, I infer that their seasonal migrations are performed almost due north and south, deviating very little indeed either to the right or left. The most western locality where they are known to arrive regularly on the English coast, is Portland in Dorsetshire, from which point they are found to extend northward, without spreading towards the west. Near the metropolis they are not uncommon, in all suitable districts, and indeed are perhaps no where more numerous than along the whole valley of the Thames. They resort to the coppices, and shrubby gardens and plantations, and in the open country are only found where the hedges are high and straggling. It does not appear that the geological structure of the soil exerts any marked influence on their diffusion.

North Brixton, Surrey,
May 15, 1838.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe," Part XV.

By Neville Wood, Esq.

In several recent numbers of *The Analyst*, have appeared articles under the above title, purporting to be analyses of Mr. Gould's splendid work. With this view the first four parts were criticised by a correspondent. Subsequently, however, it occurred to the writer of the present paper that something more than a mere review was required, in order to render the plan of extended benefit to the student. We accordingly, in many instances, added facts and opinions of our own, and in others greatly abridged or entirely altered the original of Mr. Gould, both in order to ensure fairness to the author, and to suit our own convenience. The work is now completed in twenty-two parts, folio; and it not only forms the best history of European birds in existence, but is unquestionably the most splendid and perfect ornithological publication ever issued in this or any other country. Analyses of the remaining parts will appear in future numbers of *The Naturalist*, upon a plan similar to that now presented to our readers. At the conclusion a complete list of European birds will, if desirable, be supplied. It only remains to be added, that our desire of bestowing increased care and attention on *The Naturalist*, mainly induced us to secede from the editorship of the quarterly periodical which appeared for some time under the joint-conductorship of Mr. W. Holl and Mr. N. Wood; and hence the publication of the concluding portion of the present series in *The Naturalist.*

Part XV.—The Booted Eagle, *Aquila pennata*,—Aigle botté, *French*. The figure is of the natural size, and quite as excellent as we can desire; it represents an adult. This is the smallest of the Eagles, and though Mr. Gould is quite right in regarding it as an *Aquila*, yet it has some points in common with the Buzzards. "The eastern portions of Europe, and the adjacent districts of Asia, constitute its native habitat, whence it migrates annually as far as Austria, Moravia, and the eastern parts of Germany. It feeds on small quadrupeds and birds, and, according to our author, on insects." Temminck informs us that it breeds in Hungary, near the Carpathian Mountains. The eggs are unknown. Young birds have "narrow transverse bars of sandy yellow across the breast and thighs." This bird is the Booted Falcon of the late venerable Dr. Latham.

Rustic Bunting, *Emberiza rustica*,—Bruant rustique, *Fr*. The plate contains spirited representations of a male and female of this rare and handsome bird. Inhabits Siberia, Kamtschatka, and the adjacent islands, and is said to be frequently met with in the north-east of Europe; neither Mr. Gould nor M. Temminck appear to have received recent specimens. Though probably a true

Bunting, this bird is not so typical as some of our common British species. The female wants the black on the head and ears of the male, but the sexes are nearly similar in other respects. Too little is ascertained of the habits of this species to enable us to furnish any authentic or interesting information on that head.

Common Oystercatcher, *Hæmatopus ostralegus*,—Huiterier pie, *Fr.*—Geschackte Austernfischer, *G.* Indigenous throughout Europe, frequenting low muddy places near the sea-coast. This lively and somewhat singular-looking bird runs, swims, and flies with equal ease and rapidity, although it seldom remains long in the water. Common on the coast of Lincolnshire, Norfolk, &c., and becomes gregarious in winter. "While the female is engaged in incubation, the male keeps assiduous watch, and gives notice of the approach of danger by a sharp and peculiar kind of whistling cry. The young quit the nest on the day of their exclusion from the egg, and are assiduously attended by the parents, which continually sweep round any intruder, and assail him with loud cries. The young attain at an early age the adult livery, without undergoing any intermediate gradations of plumage. The sexes are alike, and the only difference in their summer and winter dress consists in the presence of a white crescent-shaped mark half round the throat during the latter season." Lays, among the shingles on the sea-shore, four light olive-coloured eggs blotched with black. Feeds on bivales, Crustacea, marine Worms, &c. The plate represents an adult male in the summer plumage, and natural size; it is entirely to our liking.

Azure Tit, *Parus cyanus*,—Mésange azurée, *Fr.*—Lazur Meise, *G.* A male and female are given of the natural size; the figures are pretty enough in many respects, but lack the sprightliness so universally found among the Tits. Inhabits Siberia, whence it strays into the north of Europe, and occasionally as far as Germany. "Like the rest of its family it dwells in woods and forests, generally in the most retired parts; it is not so much to be wondered at, therefore, that its history is shrouded in obscurity, when we consider how little intercourse naturalists have hitherto had with the remote countries which it inhabits;" but, adds Mr. Gould, "were we to judge from analogy, we might reasonably conclude that its manners and disposition are in strict unison with those of its near relative the Blue Tit of England." The sexes, as in the other Tits, offer no difference, and the peculiar admixture of blue and white at once distinguishes the species.

Black Guillemot, *Uria grylle*,—Guillemot à-miroir-blanc, *Fr.*—Schwarze Lumme, *G.* The plate contains an adult and a young bird of the natural size. "The northern parts of Scotland and the Orkney and Shetland Islands form a place of general rendezvous for the Black Guillemot. Although a few pairs occasionally breed on the Isle of May, in the mouth of the Frith of Forth, it is evident that the high northern latitudes form its most congenial and natural

habitat. It appears to abound in the arctic circle, being equally common in the polar regions of both Continents." Feeds on small fish, crustacea, &c. Deposits its single white egg, spotted with black, on the ledges of rocks; the young are hatched in three weeks, when they are probably carried down to the water in the bills of the parents, as some other species are known to do. The sexes are similar. In winter adults have the whole plumage black, with the exception of a white patch in the centre of the wing. Young birds and adults in winter are mottled with grey and white.

Hyacinthine Porphyrio, *Porphyrio hyacinthinus*,—Talève porphyrion, *Fr.* The plate contains a fine representation, natural size, of an adult male. " The birds forming the restricted genus *Porphyrio* may be readily distinguished from the Gallinules by the greater depth and richness of the colour of their plumage, by the extraordinary development of the feet, and by the robust form of the bill. Although the number of species is somewhat limited, they are widely distributed over the tropical portions of the old world." " Like the Common Gallinule, it dwells on the borders of rivers and in all marshy situations. In its food it is partly herbivorous, feeding on various kinds of marine vegetables;" also on seeds, Snails, Frogs, &c. It runs with ease, even on muddy ground; but although its actions on land are graceful, it flies with difficulty. Breeds in marshy spots, forming its nest of aquatic plants, and laying three or four white roundish eggs. Thus both the shape and number of eggs differ remarkably from those of the Gallinules, Coots, Crakes, &c. Sexes similar.

Common Crossbill, *Crucirostra vulgaris*,—Bec-croisé commun, *Fr.*—Fichten Kreuzschnabel, *G.* The habits and changes of plumage of this species must be familiar to our ornithological readers. Mr. Gould informs us that these birds are exposed for sale in the markets of Vienna in great numbers, and that they are in considerable request. The plate represents an adult, and a young bird of the year; we have no fault to find with them.

Greenshank Sandpiper, *Totanus glottis*,—Chevalier aboyeur, *Fr.*—Pantana verderello, *It.*—Grunfussiger Wasserlaüfer, *G.* A very fair figure, natural size, and winter plumage. Widely spread over Europe, India, and Africa; also found lately, by Audubon, in America. Common on the British coast and the mouths of large rivers during its vernal and autumnal migrations. Abundant on the coast of Holland, and occurs in France, Switzerland, Germany, &c. It probably breeds in northern latitudes. Feeds on various marine animals. The chest and flanks, mottled in summer, become white in winter.

Snowy Surn, *Surnia nyctea*,—Chouette Harfang, *Fr.*—Schnee Kautz, *G.* The figures, of an adult and a bird of the second year, about one-third of the natural size, are splendidly executed. The plate is one of the best in the present Part.—This robust and hardy bird is a native of the Arctic regions. In America it

appears to extend further south than in the old world, seldom advancing beyond the north of Germany, and being occasionally met with in the Orkneys. It preys on Alpine Hares, Rabbits, Lemmings, Grous, and even, says Mr. GOULD, on Foxes. It hunts in the day, as might be inferred from an inspection of the bird, and is a dexterous fisher, seizing hold of its finny victim by a sudden clutch of the foot. "It is so shy as to be approached with great difficulty. In the woody districts it shows less caution, and, according to HEARNE, has been known to watch the Grouse-shooters a whole day for the purpose of sharing in the spoil. 'On such occasions it perches on a high tree, and when a bird is shot, skims down and carries it off before the sportsman can get near it.'" Sometimes breeds on the ledges of precipitous rocks, and sometimes on the ground, "laying three or four white eggs, of which only two are in general hatched." For the first three years the Snowy Surn is more or less barred with brown, which gradually disappears afterwards, and the old males are pure spotless white. The sexes are similar in plumage, but the female is considerably larger than the male.

RED PTARMIGAN, *Lagopus Britannicus*,—Tétras rouge. *Fr.* The British ornithologist feels a peculiar interest in this species, as it has never been known to occur out of the British islands; but since, as every sportsman knows, it is so abundant on the heaths of Cumberland, Westmoreland, Yorkshire, Wales, and many parts of Ireland, surely we cannot encourage the monopoly of our northern brethren by continuing the name *L. Scoticus*. The plate is beautiful, and represents a male and female of the natural size.

BLACK KITE, *Milvus ater*,—Milan noir, *Fr.*—Schwartzer Milan, *G.* The figure of an adult, two-thirds of the natural size, is in many respects very fine. Common in the south of Europe, but we are not aware of its having ever occurred in Britain. Still, considering the wandering habits of the members of this family, and the great powers of flight possessed by the Kites, Mr. GOULD thinks it may one day be met with in the southern counties. Also inhabits India and North Africa. Our author has noticed this bird in its natural state, and finds its habits similar to those of the Common Kite. Builds on trees, laying three or four yellowish white eggs thickly spotted with brown. The sexes and also young birds are similar.

BAR-TAILED GODWIT, *Limosa rufa*, Barge rousse, *Fr.*—Dikfussiger Wasserlaufer, *G.* Two pretty figures, representing the summer and winter plumage, and of the natural size. Breeds in Iceland, Lapland, and the regions within the Arctic circle, but only visits Britain on its vernal and autumnal migrations, thus merely considering our island a convenient resting-place on its passage. Frequents marshy places and rivers near the sea, and feeds on aquatic insects, Worms, and mollusca. "They run with great facility over the oozy ground, and fly, when roused, to a considerable distance, uttering as they rise on the wing a hoarse deep

note. Both sexes assume the red attire in spring, but the female is larger than the male, and more dusky in colour.

Alpine Dunnock, *Accentor Alpinus*,—Accenteur des-Alpes, *Fr.*—Alpen Fluevögel, *G.* The figures, of a male and female, are of the living size, and perfectly characteristic. Inhabits the bleak and mountainous parts of the Continent. "It is extremely common in Switzerland and the Tyrol, ascending in summer to their most elevated portions, and seeking shelter, as winter advances, in their vallies and central regions." This bird has now claimed a place in our fauna several years, and not a few specimens have been met with in Britain. Subsists on Worms, insects, &c., and is said to destroy Locusts and Grasshoppers. Breeds in the fissures of rocks, laying four or five greenish blue eggs, only differing from those of our Hedge Dunnock in size. The sexes do not differ.

Mountain Linnet, *Linaria montana*,—Grosbec de-montagne, *Fr.*—Arktische Fink, *G.* One figure, of an adult male in summer, is given; we find no fault with it. This bird is intermediate in size between the Whin Linnet (*L. cannabina*) and the Redpoll Linnet (*L. minor*). It is abundant in the north of Europe, and within the Arctic circle. Common with us in winter, and breeds in the uplands of Scotland, the Orkneys, &c., but in limited numbers. The female has no pink on the rump, and is somewhat smaller than the male.

Short-toed Lark, *Alauda brachydactyla*,—Alouette à-doigts-courts, *Fr.*—Kurzehige Lerche, *G.* The plate contains figures of a male and female; we greatly prefer that of the former; the other has too much the appearance of a young bird. Abounds on the hot sandy plains of Spain, and is found along the whole of the borders of the Mediterranean. Never occurs further north than the south of France, and there but seldom. Breeds on the ground, and lays five eggs of an isabelle yellow. The plumage of the female only differs from that of the male in being duller; and young birds during the first autumn "have the outer edges of each feather margined with buff." Although the hind claw is somewhat produced, and although the whole foot is essentially that of a Lark, it differs remarkably from that of our Sky Lark. The bill is also slightly more robust.

Dalmatian Pelican, *Pelecanus crispus*.—An adult and a young bird, about one-fourth of the size of life, are figured in E. Lear's usual bold and excellent style. Mr. Gould commences by expressing just surprise that so large and striking a bird should so recently have become known to the ornithologist. The individuals from which the figures are taken were sent to the author by Baron De Feldegg, who has killed as many as twenty-four on the shores of Dalmatia. "*P. crispus* differs from the Common Pelican in possessing a beautiful crest and mane of narrow, elongated, silky feathers; in the naked space around the eye being smaller; in the feathers of the breast being stiff, lanceolate, rounded at the

points, and of a firm elastic texture; in the body being more bulky, and larger in all its proportions, in the tarsi being stouter, of a different colour, and considerably shorter." Baron De Feldegg, however, observes that adults may be found at all seasons both with and without the crest. "The young, which are very seldom seen, are wholly brownish grey, the feathers being much finer and closer in texture, and more silky in appearance than in adults." This bird appears to have been discovered, by the above-mentioned gentleman, in Dalmatia in 1828.

Yellow-breasted Bunting, *Emberiza aureola*,—Bruant oréole, *Fr.* The Buntings have ever been favourites with us, and the present species appears even to surpass the others of its genus, which we have long been wont to admire, in the tasteful distribution of its rich tints. Beautiful figures of the male and female are given. Its native habitats are Kamtschatka, Siberia, and the Crimea, but it has occasionally been found within the eastern confines of Europe. The female lacks the bright hues of the male, but, like the females of all the Buntings with which we are acquainted, is nevertheless a handsome creature. "A specimen of the male, one of the very finest we have ever seen, was obligingly lent to us by T. B. L. Baker, Esq., of Hardwicke Court, Gloucester," who some years ago published a general catalogue of birds.

Whistling Swan, *Cygnus ferus*,—Cygne à-bec-jaune, *Fr.*—Cygno salvatico, *It.*—Sing Schwan, *G.* Mr. Lear has represented an adult, one-third of the living size, in rather a difficult position, namely, standing on land; but he has acquitted himself admirably. This bird is confined to the north of Europe and Asia; its more particular habitat being within the Arctic circle. In severe winters it is not uncommon in England, but it seldom occurs here in mild seasons. A few pairs used formerly to breed in the north of Britain. Mr. Gould observes that the Whistling Swan is kept in a half-domesticated state in the parks of some noblemen, though we never met with it anywhere. Its habits and economy appear closely to resemble those of the Mute Swan. The eggs are four inches in length, and two and three-quarters in breadth. The adult female is smaller than the other sex. "Its usual call-note resembles the sound of the word *hoop*, loudly and hoarsely uttered several times in succession."

Black Scoter, *Oidemia nigra*,—Canard macreuse, *Fr.*—Trauer Ente, *G.* A lovely and very characteristic figure of the adult male, natural size. Common on the shores of England and the Continent, subsisting "almost entirely on bivalves, such as the Common Mussel, &c.; and they especially abound where large beds of these shell-fish afford them an unfailing supply of favourite diet, their close adpressed plumage and great power of diving admirably fitting them for their destined mode of life. It passes southward when the lakes and rivers in its summer haunts become frozen. Of its nidification nothing is ascertained. This

bird undergoes no seasonal changes of plumage, but the males are somewhat richer in hue than the females, and have the bill brighter.

Green Sandpiper, *Totanus ochropus*,—Chevalier cul-blanc, *Fr.*—Culbianco, *It.*—Punktierte Strandlaüfer, *G.* Dispersed widely over Europe, Asia, and Africa. It is chiefly met with in this country on its spring and autumnal migrations, though a few appear to breed in Wales and other mountainous districts. Frequents ponds, rivulets, and ditches, instead of, like most of its congeners, the sea-shore. "The snow-white rump of the Green Sandpiper renders it a conspicuous object when flushed, at which time it utters a shrill whistling note: it runs with great activity, but generally flies low, skimming over the surface of the water, and following the bends and angles of the stream. It differs from the Wood Sandpiper in its larger size, its shorter tarsi, and in the more diminutive spotting of the upper surface." The sexes are nearly similar. The nest is made beside a stream, and the eggs are greenish white blotched with brown.

Wood Sandpiper, *Totanus glareola*,—Chevalier sylvain, *Fr.*—Wald Strandlaüfer, *G.* "This species has been so frequently confounded with the preceding, that we are induced to figure both on the same plate, in order to enable our readers more readily to distinguish their differential characters. There is no difference in the colouring of the sexes of either species, and as their plumage is not influenced by the seasons or other causes, we trust our plate will illustrate every feature necessary to render their distinctness sufficiently apparent. The Wood Sandpiper is still more rarely seen in the British Islands than its near ally, but in every other particular the history of the preceding species is applicable to the present; it is, however, even more widely dispersed, as is proved by its being found not only over the whole of the Asiatic continent, but in most of the islands of the Pacific Ocean also, which we believe is not the case with the Green Sandpiper." Both figures are admirable, and scrupulously exact.

Here, then, we close for the present; but hope, with the approval of our readers, to continue these Sketches at at early opportunity.

Campsall Hall, Yorkshire,
May 29, 1838.

HOURS AMONG ROCKS AND CLOUDS.

Plinlimmon.—Day the Second.

By Edwin Lees, F.L.S.

(Continued from page 193.)

"I seek the birth-place of a native stream.—
All hail, ye mountains! hail, thou morning light!
Better to breathe upon this aëry height
Than pass in needless sleep from dream to dream."

Wordsworth.

There is something extremely stimulating to the feelings in the din and bustle preparatory to a jaunt. As the skies, the Horses, or the baggage are successively examined, and one messenger rapidly succeeds another, a fidgetty excitement urges on the limbs to supererogatory movements, which it would be wisdom to restrain were that within the bounds of possibility. Then, just as every thing is ready, something is forgotten, and all is again thrown into confusion—anything but the right comes first to hand, and at last Patience herself feels inclined to imagine that a personage ever hovering strangely about on such occasions, has put his paw—or his *hoof* upon it! Such things will occur at home under the best regulations; and, with a dozen assistant "aids to reflection," they will occur even at an inn.

I shall not stop to discuss the merits of a breakfast which I shall suppose eaten, but at once prepare for a bivouac upon the breast of a mountain, for the landlord (an authority above all books upon such a subject) *recommends* a lunch to be taken as a counterpoise to the levity of the atmosphere among the bogs and rocks, while a pocket-pistol is indispensable in a territory where every inhabitant reeks with a superabundant distillation of mountain dew. I had found, on inquiry, that it was nearly twelve miles from Llanidloes to the summit of Plinlimmon, and therefore engaged a Welch pony to shake me to the foot of the mountain, with another bearing a guide-post beside me, as I concluded it would be occasionally necessary to *point* him (he could scarcely do more) in the route I wished to take up the course of the Severn to its primary fountain. In spite of every protestation and objurgation, though comparatively fine in the valley, I perceived a distant mist lurking about and ambulating upon the tops of the farther hills, and consequently, leaving nothing to chance, held my macintosh in reserve, should an encounter with the chill videttes of the tempest be unavoidable; and, thus "prepared for squalls," slowly progressed round the heavy, dark, and turreted market-hall that seems thrown stupidly in the way for travellers to tumble against in the dark, and left Llanidloes over the one-arched bridge that bestrides the Severn below the wier and mill at its western extremity.

The river above the wier is reduced to a mere rural brook, where little of the romantic is presented to view, the stream being shallow and flowing through green meadows fringed with Alders. At the eastern end of the town is a stone bridge of three arches, just above which a brook called the Clwidd disembogues itself into the Severn, with a stream almost superior to that of the latter, so that I think a stranger would be inclined to trace the Clwidd as the more legitimate origin of the Severn. Here, on the bank, is a large old umbrageous Sycamore, a favourite tree in Wales, and opposite to it, on the southern bank, is the plain church of Llanidloes, with its low pent-house tower and battered Yew-tree.

We proceeded by the road up the acclivity that leads to Felindref-gate, leaving the Severn and another tributary called the Dylais, that here breaks into its southern bank, on the left. On reaching the top of the hill a somewhat pleasing scene presents itself—a bold eminence opposite is well-clothed with Oaks, on the left rise some Heathy hills planted partially with Larch, and in the depression below appears the infant Severn here termed "Hafren," almost hidden from view, and fretting itself over several wiers that obstruct its course. Many pleasing cottages half hidden in rising shrubberies, and mills for the manufacture of flannel, now present themselves to view, and in various spots long lines of railing are white with flannels exposed to bleach in the open air.

A little beyond is Melin Felindre mill, and a wooden bridge over the river, and on the right a farm-house called Old Hall. At rather more than three miles is another old farm-house on the left called Glyn Hafren, with a tottering wooden bridge across the stream, which here begins to assume an Alpine aspect, brawling over stones and rocks, though within very narrow dimensions. The view now improves considerably, the southern eminences putting on a bolder aspect, and being much dotted with wood. Birch now appears on the side of the river, intermixed with Alders and Aspens. A natural Birch-wood some distance farther on the sloping southern bank has a very picturesque effect, many of the trees being deeply furrowed at their bases from age, grey with Lichens, and bearded with Mosses, and the silver colonnade stretches up the hill in peculiar beauty.

The road at four miles enters upon rocky scenery, though the mountain is not very lofty, but the disjointed masses of several of the cliffs, decorated with Ivy by the hand of Nature, seem to invite attention. I here observed a mass of rubbish on the side of the hill, and found a Lead-mine was in progress by a level driven into the heart of the rock. This I understood had been lately commenced. A vein had evidently been arrived at, for I picked up several specimens of Copper-ore and Quartz. The fundamental rock is Slate, in the mass of which the veins of ore are interspersed, probably by the agency of Trap throwing up the Slate, and forming the various romantic eminences here unfolding themselves in continued succession; for a little farther on several Trappoid rocks appeared, and

various disjected masses seemed poised as if ready to fall on the slope of the mountain. An eminence called the Gyess, evidently Trappean, rises about two miles beyond and mounts to the height of about 800 feet perpendicular with a sublime effect. As I returned in the twilight, I thought this scene, where the sprightly Severn foams among the rocky fragments, and dashes on as if thus early to attest her "swift" career, approaching even to grandeur. It is certainly the best between Llanidloes and Plinlimmon.

The road now winds at the foot of a hill which appears a natural Oak-forest, and, contrasted with the purple Heath peering out at every interval, and the bare or golden Gorsy hills beyond, although very dwarf, presents a verdant and extremely refreshing appearance to the eye, intermixed as it is with glowing wild flowers of several species, and the bright ruby berries of the Alpine Bramble.

We now enter upon a series of barren uplands, interspersed with spots of bog and marsh, here and there crossing a rocky cwm whose Rushy prill splashes down among the Ferns and underwood, and occasionally passing patches of road little better than quagmires. The pleasing view, however, repays the trouble of the ride, for Plinlimmon, sullen, black, and surly, with his long array of frowning, bleak, barren and cloud-wreathed promontories, now appears full in front, while the Severn, reduced to a mountain torrent, is seen chafing the stones in the deep hollow below; and here and there she timidly pauses in a deep silent pool with ferruginous-tinged rocks about her, as if considering her future destiny, or anxious to retrace her steps to the Heathy turbaries waving with downy Cotton-grass.

Having ridden more than nine miles, we approached close to the margin of the river, here extremely shallow among masses of stones, and a low dismal shealing, called Blaen Hafren, presented itself to view. At this farm it was necessary to leave our Horses, for here Plinlimmon actually commenced, and no vestige of shelter in any other form or shape is to be met with on this side of his kingdom of bog and mist. We therefore braced up our nerves for the ascent. Just above Blaen Hafren the infant Severn passes a barrier of Schistose rock penetrated with Trappean veins, about thirty feet high, in a picturesque manner which deserves to be delineated, as it might make a very pretty sketch. The stream, concentrated almost to a spout by continued attrition, has worn a deep gully in the rock, down which it falls for some feet, and then plunges into a singular black and deep circular hollow, caused by the incessant whirling and agitation of the water. From this hollow, which seems like the track left by some monstrous Leviathan in the stone, the waters gently emerge, and in a silver stream roll dulcetly over the lower ledge of the rock, forming a small cascade, which breaks upon and curls round gigantic masses of Trappean rock hurled from the steeps above at some ancient period, and now lying mementoes of the furious water-

strife that then raged. All was now of a soft and mild character, and the descending current urged its silver spray as if unwilling to disturb the repose of the stony masses that contributed their deep solemn intonations to the aqueous concert. A pair of Dippers (*Cinclus aquaticus*) dashed swiftly through the hollow as we were gazing at the falling waters.

Above the fall the river winds among the rocks, retaining now only the character of a mountain rivulet hardly to be distinguished from its sisters, each rolling its tiny tribute down the dark cwms. The last bridge now appeared—made for Sheep: a couple of sticks stretched from side to side and covered with turf, formed the simple but precarious structure over which we now stepped, and it tottered beneath us. Just above the bridge, close to the stream, I gathered some luxuriant specimens of *Saxifraga stellaris*, as well as in another spot higher up the mountain, where the river, in the vigour of its youth, tumbled in a sounding cascade over some large masses of rock. A little higher up, a bog on the verge of the stream was adorned very profusely with the pale blue flowers of the beautiful and delicate *Campanula hederacea*.

I strongly recommend the visitor to Plinlimmon to trace the course of the Severn from Blaen Hafren to its rise—the scene varies at every step so as to prevent tediousness, while the jutting ribs of the hill are insensibly surmounted, and the occasional crossing and re-crossing of the little struggling and whimpering Severn is really amusing. At last the rocks cease, the banks of the glen rise high, and a dreary turbary, grimy with black bog earth, presents itself, with stubby masses of Heath and Rushes. Here the water in the bed of the stream, not half way up the shoe, trickles silently and almost imperceptibly, and on one side is a coagulated mass of ferruginous mud, tinted with the iron deposited from the water here stealing from the bank, which is dignified by the appellation of the head of the Severn. There is no pond, as stated by some writers, and generally supposed, though the hollow continues much further up the turbary, subdividing into several divarications, each bringing down a trickling rill, but none depositing any ferruginous stain on the mud, except the small chalybeate spring I have mentioned. This, therefore, I presume is the badge of distinction.

Of course I quaffed a cup of the Severn water from its accredited fountain head, and then, sitting down on the Moss, resigned myself to reflection. Here was a striking instance of the power of association. From a boy I had long desired to see the source of the Severn.—I now looked down upon a barren and sullen boggy hollow, deformed with unsightly Rushes, from which not even a ripple or a murmur emanated, its dingy sides sable with bog-mud, and altogether apparently unworthy a momentary glance. Undoubtedly whoever came ignorantly in contact with it, would hardly feel inclined to do otherwise than rush from the spot with all possible speed. But stop! from that humble initiatory

spring, the majestic—the powerful—the expansive Severn, that reflects in its stream the spires of Shrewsbury, Worcester, and Gloucester, and on whose splendid estuary the fleets of India repose after their voyage to the isles of the new world—the Severn! on whose banks Hotspur and "Harry the king" at Shrewsbury, Edward and Margaret at Tewkesbury, and Charles and Cromwell at Worcester, have fought, and dyed the fields and the waters with gore—the Severn! on whose shore the roofs of Berkeley have rung with the shrieks of an agonizing king—here has its origin. The Severn, renowned in legendary and poetical lore, here has its outlet into the world. Sabrina, "virgin daughter of Locrine," is here made goddess of the river, and

"By the Rushy-fringed bank"

here takes her stand with her rustic urn, amidst clouds, tempests, and continued rain, winging the thought to Comus and his "monstrous rout," and Ludlow's massy towers; and preparing, as her subject tributaries defile from their Spongy morasses, to pour with her increasing waters commerce, enterprise, the fruits of industry and the stores of trade upon her tidal wave.

Several other rivers issue from the deep recesses of Plinlimmon, of which the Wye and the Rhydol are the most remarkable. The former weeps from a desolate turbary among the southern ravines of the mountain, and, joined by a hundred nameless prills, gallops madly into the vales of Radnor, spinning round and round in long circuits with the most exuberant and playful wildness. The Rhydol flows more soberly from a small lake in a punch-bowl hollow, surrounded by black precipices on every side but the one that opens to admit the vagrant stream, that soon enters upon a short but most romantic course into the sea at Aberystwith, mingling in its way with the foaming waters of the Monach in the profound abyss below the Devil's Bridge. The scenery about the head of the Rhydol pool is the most striking in the Plinlimmon defiles, the frowning rocks dripping with moisture, verdant with Mosses and Saxifrages, rearing their craggy masses almost perpendicularly, and throwing the lake they surround into the deepest and blackest shadow.

In a hollow at the northern base of the mountain is a winding lake of dreary and desolate aspect, called the Begalyn Pool. It receives a number of plashy rills into its embrace from the redundancy of the weeping Mosses above it, and in its turn pours forth a stream that becomes a tributary to the Severn below Llanidloes. A mass of black rocks hem it in on one side, with a rocky inlet a short distance in advance of them, torn doubtless from their embrace by some elemental crash. Trailing along the margin of the shallow waters of the Llyn near its head I noticed an abundant growth of the curious little *Ranunculus reptans*. There is an anecdote respecting this Begalyn Pool, which, as it bears upon the changes

that are continually taking place in the aspect of Nature, and may perhaps serve to explain other anomalies that are very puzzling to the observer, is I think worth recording, particularly as it has by accident met my view in a periodical now extinct, call the " *Cambrian Magazine*, or Celtic Repository" (1829), into which I opine few naturalists are likely to dip. The author, who appears to have been one of the angling fraternity, though he has concealed his name, thus mentions the occurrence.

" There is a circumstance respecting the Bygeilyn (Shepherd's Pool), contrary to the general laws of Nature. Twenty years ago there were no fish in it. A writer has observed, that all bodies of water produce fish; some of the Alpine lakes, situated amid almost inaccessible glaciers, have invariably been found to contain Trout; and he sensibly adds, that no doubt the spawn was originally carried up through the agency of birds; which fact I am prepared to support, having myself shot a wild Mallard in the bill of which I found the ova of fish. About twenty years ago some gentlemen were Grousing on Plinlimmon; the conversation turned upon the peculiarity of Bygeilyn being destitute of the finny race, and the possibility of stocking it from a neighbouring rivulet; a staff net was procured, and some dozens of small Trout, caught in the river Rheidol, were turned into the lake. At that time myriads of Horse Leeches swarmed in its water. Some of the Trout, when placed in the pool, lay upon their sides faint and exhausted. Strange as it may appear, the rapacious Leeches attached themselves to the sick fish, and actually devoured them. Others of the Trout were more vigorous; these, and their progeny, having enforced the *lex talionis* with a vengeance, and not a Leech is now to be seen. The late Captain Jones, R.N., of Machynllaith, and another gentleman now living, were the parties alluded to." Thus far the *facts* of Mr. " Cambrian," who then enters upon a theory to account for the " former non-existence of fish" in Begalyn, which he supposes might have arisen from mineral particles having poisoned the water, now rendered wholesome by a thick deposit of black earth over the bottom from the turbary. But with these conjectural matters I shall not meddle, and therefore, leaving the pool to its repose, must now wade through the bogs up the mountain again—pausing, however, one moment on the soft turf to refresh wearied Nature with a sandwich and a draught of brandy. Barren and naked as the scene is, it certainly now stands forth in brighter relief. And here (as the opportunity presents itself) let me give a friendly warning to all wanderers never to trust an *absent* friend with the pocket-pistol, and above all never to take it without a case. A few weeks after the excursion I am now describing, I was induced, in an evil hour, to join a small party in ascending to the apex of the hill from the Cardiganshire side. One gentleman had a bottle of sherry in his pocket, with which in imagination we had toasted the misty mountain till all its grey cairns rattled their piled

heaps in clamourous exultation, and the hollow glens had hoarsely echoed their thanks in exulting reply. Alas! we were indeed reckoning without our host, who seized upon the Lion's share for himself. Scarcely had we mounted the higher ridges, than conflicting blasts shook us about like Thistle-down, and vain for some time were our efforts to get on. At last, in close phalanx we pressed along for a huge cairn we saw rising before us, and, tacking about towards its leeward side, laughed at the baffled blast. Down, in the thoughtlessness of the moment, fell two or three upon the side of the cairn, and amongst the rest the sherry-bearer. The wine was now called for—when, with dismay and confusion, our companion produced from his pocket the sealed *neck* of the bottle, but its nether part, to our sad mortification, had sustained a compound fracture as he flopped down upon the pointed stones, and the wine was thus "left behind," a libation to the Crows.

At a distance Plinlimmon appears to constitute a long abrupt ridge, which on a nearer view seems to have five or more distinct points rising a little higher than the general mass—these were formerly used as beacons, and are now covered with carneddau (piled heaps of stones)—hence the origin of the Welch name Pen Lumon, or the five beacons. This name, however, would appear not to be very ancient, as in *Giraldus Cambrensis* these ridges, with other subject masses that stretch on to the Teivy lakes, bear merely the general name of the Elennith mountains. Having once entered upon the outworks of Plinlimmon, all definite shape disappears, and a series of dismal winding defiles and dark Hog's-back ridges appear in wearying succession, without a single rising pile of uncovered rock to break the monotony, while treacherous bogs, concealed within the turf, plunge the heedless stranger in their plashy embrace as he urges on his weary way. Add to this, a wreathy mist descending in a moment obscures every object, and confuses the ideas of a stranger to the ground to such a degree, that, vainly attempting to note his devious progress up the dark and deep defiles, he would be likely to attempt a return in the very opposite direction from that which he sought; while wind and rain, almost constant concomitants of this aquarian district, might complete a scene of disaster difficult to escape from. Hence a guide becomes indispensable on this mountain, and the difficulties of access to it enabled OWAIN GLUNDWR to maintain himself here with a small force for a considerable time.

I can only compare Plinlimmon to a number of hills with their subject ridges and passes penetrated by a Serpent-host of streamlets. These gloomy mounds are piled confusedly around a wide central depression or elevated plain, now constituting a moss or turbary, covered with Heath, Rushes, and various species of *Vaccinium* and *Lycopodium*. This is intersected by the hand of Nature with deep gulfs and an endless series of ditches and hollows, formed by the powerful

action of water upon the loosened soil. Hence it is toilsome work to cross this turbary from one eminence to another, and amidst rain and mist confusing and confounding. No lady tourist should suffer herself to be tempted to an eminence where the roughest gales are eternally battling with each other, for assistance is scarcely available in some places, and I was witness, on my last ascent, to the unpleasant incident of a lady being violently hurled to the earth by the fierce wind, in spite of every effort, while her veil and bonnet sailed, beyond the ken of vision, over the precipice. Blood profusely flowed from her head, meeting the sharp rocks in her descent, and though little beyond fright eventually ensued, such disasters to females are not very pleasant.

The great mass of Plinlimmon consists of primary Slate, which has, however, been subjected to an unpleasing process by the vicinity of Trappoid rocks, and their injection into its strata from beneath. Hence, though the masses *in situ* are mostly concealed by turf and Sphagni, the inequalities of the surface, and the Quartzose fragments scattered around, give abundant evidence of the process that has taken place in the magnificent crucible of Nature. Schistose piles occur in various places on the ridge, vertically elevated and serrated sharp as a needle, whilst at intervals, amidst the elevated plain and turbary, broad masses of Quartz appear like heaps of snow starting from the Moss. The elevated points around the turbary are mostly Trappean Quartz, the loosely-crystallized predominating; and close to the highest point I found a beautiful slab of Siliceous crystals on Greenstone. The whole mountain, therefore, must be considered as modified by igneous agency, although the mosses and bogs that conceal its rocks derogate from that magnificent regal aspect which most hills of eruptive character assume. The sides and buttresses of the mountain betray the same origin as the summit, for I noticed, close to Blaen Hafren, huge masses of indurated rock in the infant Severn, penetrated with Quartzose veins, and a rock of similar appearance presented itself higher up the stream. By the side of the Rhydol Pool I also observed a mass of Breccia, the pebbles composing which were very smooth, as if subjected to the attrition of water; but the connection of this mass with the Schistose strata was not apparent. A dome of Whinstone of enormous size is mentioned, by the anonymous writer in the *Cambrian* I have before referred to, as occurring in the ascent of the hill from Machynnleth, but this did not come under my notice. The dependent buttresses of the mountain towards Pont Herwid on the Aberystwith-road abound with Lead-ore, interjected probably into the rock when in a fluid state by the igneous action from below; and so great is the quantity this vicinity has yielded, that it bears the appellation of the Welch Potosi.

Every elevated point on Plinlimmon is crowned with cairns, which are continually increased by the hands of idle shepherds, so that some of them form

considerable accumulations, though rather dangerous to tread upon. Yet when the wind blusters in its fury, it is by no means unpleasant to pause for a few minutes on the leeward side of these wind-shields. The materials of them, being all taken from the rocks around, present a fund from whence the geologist may draw *ad libitum*, and the numerous fragments of pure white Quartz among them, mark the character of the mountain.

I can say but little as to the prospect afforded from the peaks of Plinlimmon, on account of the all but perpetual fogs that surround them, and of which I have had the full benefit on every occasion. Ere I could scale one of the ridges at the time I here refer to, a squadron of clouds had occupied them for a review day, and they kept the ground so well, that though I squeezed in among them as well as I could, it was to little purpose, for it is as hopeless to wait on a mountain top for the clouds to pass off, as to stand in a door-way in London while the crowd goes by! One single break in the array occurred, however, in one direction, where, far beyond a long-extending rank and file of beaming hills and shining vallies, Craig Breiddin, like a fairy isle, and Moel-y-Golfa, like a distant pyramid, crested the horizon;—but in no other quarter would the envious clouds disperse, though retreating in thick order to the bases of Cadir Idris and the hills beyond Machynnleth, they showed the intervening country, cumulus upon cumulus shining bright in the rays of the descending sun; while the vapours revealing the valley of the Lery, and bringing a focus of light upon its bounding promontory, that little river was seen as a winding vein of silver lightning up its emerald glen, and twining its rapid but romantic course to the yellow Sands of the sea. Southward, among the turbulent mountain indentations that seemed like upreared piles of rapid waves, a few lakes faintly gleamed in the scalloped concavities—all else but the occasionally revealed rocks, and the rhimy Sedges and Heaths, were entirely concealed from view, and father ocean was closely mantled in his misty robe.

Red Grous inhabit the extensive wilds of this region, though a single one only occurred in the course of this day's perambulation, which was, however, at the close of August, after they had been pretty well attended to by sportsmen. Scarcely any other bird was visible, except a very numerous flock of Golden Plovers (*Charadrius pluvialis*), near the summit, whistling as they flew round in wide circles; and an occasional Kestril poising on out-stretched wing.

Twilight was now rapidly approaching, involving the deep perforations of the mountain, its cwms, and its acclivities in purpureal solemnity. We hastily made our way, therefore, through the plashy bogs, Whin, and Heath, and scrambled down the rocks the shortest way to Blaen Hafren. Here I took a last glance at the infant Severn dashing down the rock into its deep circular basin, and emerging in a playful waterfall, with the Dippers still quivering their plumage there, and

flying to and fro through the crevice—then mounting our Horses, and again plunging and floundering amidst the stones and morasses we could now scarcely descry, we started at a sharp pace for Llanidloes, the Severn wailing a shrill farewell to us, and foaming down its rapids into the deep Birch-shaded valley below, with a vain effort to overtake us in our flight.

It may perhaps be thought by some readers, that my remarks are not always very closely limited to the subject of Natural History, as they ought to be; but I reply, that the naturalist in his excursion is by no means obliged to abandon his reflective powers, but should rather improve and enlarge them. And if, as will sometimes happen to the keenest hunter of specimens—*nulla viam fortuna regit**—success is not quite as one could wish, the landscape puts on a dark robe, and a black frown; then, undoubtedly, if imagination weaves in her busy loom a varied tissue of amusive thought, it prevents the gloom of disappointment corroding the dejected mind. However, that I may not give colour to rebellious wandering from the legitimate objects of *The Naturalist*, too far, I shall here subjoin a list of the plants deserving record, that I gathered in the vicinity of Llanidloes and Plinlimmon for the few days I was located there.

PLANTS GATHERED IN THE VICINITY OF LLANIDLOES, MONTGOM.
August, 1837.

Ranunculus reptans.—In one spot on the shore of the Begalyn Pool, Plinlimmon. The extremely minute flowers of this plant, and its prostrate filiform stems rooting at every joint, give it a very peculiar and interesting aspect, whether it be really esteemed a species or not. Certainly when compared with a luxuriant lowland specimen of *R. flammula*, the difference is very obvious. One of my specimens grew almost erect upon the bank of the Llyn, throwing out abundant beard-like roots, which however were useless, as they did not come in contact with the soil.

Trollius Europæus.—By the side of the bog at Can Coed, above the wooden bridge over the Severn, about a mile and a half from Llanidloes, towards Plinlimmon.

Corydalis claviculata.—In several hedges on the heights above the town, particularly near the Felindref turnpike-gate.

Fumaria capreolata.—On the side of the Machynnleth-road.

Viola palustris.—In a boggy field at Can Coed.

V. tricolor ?—Some fine-flowered specimens of this occurred at the base of a romantic range of Heath-clad hills, overlooking the Clwddach valley, but I rather feel inclined to regard them as varieties of *V. lutea.*

* VIRG. *Æn.*, xii., 405.

Hypericum dubium.—On the Aberystwith-road, and in a natural Birch-wood in the Clwddach valley.

H. elodes.—In a bog in the hollow of the Heathy hills before-mentioned.

Androsæmum officinale.—In the woods at the Devil's Bridge.

Arenaria rubra.—Abundant on the Machynnleth-road.

Stellaria glauca.—In various moist hedges.

Acer campestre.—Extremely common, more particularly near Welchpool.

Sedum Anglicum.—On the Schistose rocks above the three-arched bridge, and on the banks of the Rhydol, near its fall.

S. Forsterianum.—In moist crevices below the Rhydol fall, but not very abundantly.

Saxifraga stellaris.—Side of the Severn above Blaen Hafren, and on the dripping rocks above the Rhydol Pool on Plinlimmon, a few specimens still beautifully in flower.

Ulex nanus.—Hills on the Machynnleth-road, where one was completely golden with this plant.

Ornithopus perpusillus.—On the Slate hills.

Rubus idæus.—Very common in rocky and woody spots about Llanidloes, in every direction.

R. suberectus.—This beautiful Bramble is an invariable accompaniment of the moist sub-alpine tracts of Wales, and, whether displaying its pure white flower, or bright red fruit, cannot fail to attract attention and admiration. I gathered many fine specimens in the thickets on the Machynnleth-road, and it gems the woods to the very base of Plinlimmon.

R. affinis?—I am afraid this Bramble can hardly be satisfactorily distinguished from *R. suberectus.* At all events botanists seem much puzzled with it. It is *R. nitidus* of Smith, and, according to Dr. Lindley, *R. plicatus* of Mr. Borrer in *Supp. to English Botany.* Some of the varieties of *R. rhamnifolius*, too, so nearly resemble it, as to deceive the most careful observers.

R. Köhleri?—I met with a glandular Bramble here, which I must leave in the uncertainty that still envelops the members of this difficult genus. It seems different from *R. rudis*, though the latter is combined by Mr. Borrer with *R. Köhleri.*

Rosa spinosissima.—In some abundance by the side of the road, just beyond the one-arched bridge on the way to Glyn Hafren.

R. villosa.—Further on in the same direction.

R. canina Forsteri.—In a hedge on the same road.

Pyrus aucuparia.—Several fine old trees glistening with red berries in the lanes round the town.

Prunus padus.—In woody spots towards Plinlimmon.

Vaccinium vitis-idæa.—In the turbary on Plinlimmon, above the source of the Severn.

Campanula hederacea.—Very abundant on the moist bank in an Oak-wood close to the Machynnleth-road, about two miles from Llanidloes; in a bog in a hollow of the hills above the Clwddach, nearer the town on the same road; and on the Plinlimmon bogs above Blaen Hafren. Exquisitely beautiful wherever it appears.

Hieracium maculatum.—On the Slate-hills above the Chaddach.

H. umbellatum.—Very common on the Heathy declivities around.

Myosotis repens.—In ascending Plinlimmon from the Begalyn Pool I caught a glimpse of some clusters of light blue flowers in the middle of a quaking bog, to which they gave an aspect of beauty, though almost inaccessible from the deep waters around them; by baring my arm, however, I managed to obtain a handful, which, on examination next morning, proved to be the above. The base of the stem is decumbent, throwing out numerous stolones with roots, which multiply the plant abundantly. Stem and stolones with numerous spreading hairs. Leaves lingulate, hairy, especially at the base, the lower ones attenuated into a channeled footstalk, the rest sessile, often decurved. Racemes not leafy in my specimens. Flowers on long pedicels, with close adpressed hairs, recurved when in fruit, and thrice as long as the calyx. The latter is deeply divided, with adpressed hairs, the apices of the sepals connivent upon the very smooth fruit. Petals azure, light purple towards the base, with a brilliant yellow eye. Not so large as in *M. palustris.* I have given the above particulars, taken down at the time, that no mistake might be imagined with regard to my plant, which was first distinguished by Mr. Don, in Scotland, and since found in Sussex by Mr. Borrer, by Mr. Don in Kent, and Mr. Backhouse in Yorkshire. The sketch I made of the Plinlimmon specimens agrees precisely in character with the plate in *Eng. Bot.*, Supp., t. 2703, but my stolones are far more numerous.

Calluna vulgaris, var.—With pure white flowers, in a natural wood above Can Coed on the Severn.

Anagallis tenella.—A common concomitant of the bogs in the vicinity.

Scutellaria minor.—Bog on the hills above the Clwddach, plentifully.

Empetrum nigrum.—Birch-wood on the Machynnleth-road.

Platanthera chlorantha.—In the same wood.

Narthecium ossifragum.—Very abundant in various bogs.

Triodia decumbens.—Plentiful on the Slate-hills about Llanidloes.

Hymenophyllum Wilsoni.—On some rocks near the Rhydol, at a plank over a dangerous gulph of the river called Pont Bren.

Lycopodium clavatum, *L. alpinum*, and *L. selago*, all covering the banks of the turbaries on Plinlimmon.

Splachnum mnioides.—I picked up a small tuft of this Moss in fruit, on one of the stones of the highest cairn, whither it had been wafted by the blast, but how far it had travelled I cannot say.

I found an old Birch-wood on the Machynnleth-road, full of venerable furrowed trees, and elegant pensile foliage, a favorite locality of the Lichens and *Fungi*, and I doubt not some rare species might be found here. I noticed among the former, *Evernia prunastri*, with apothecia, which is of uncommon occurrence in this state; *Variolaria griseo-virens*; *Parmelia saxatilis*, with apothecia; and some beautiful specimens of *Usnea florida*. *Stereocaulon botryosum* occurred on the bleak heights of Plinlimmon, with several curious species of the *Scyphophori*, or Cup-lichens. Among the *Fungi*, I gathered *Agaricus pantherinus* in the Birch-wood, and *Scleroderma vulgare* was very plentiful on banks near an Oak-wood in the same vicinity, but nearer Llanidloes.

ON THE HABITS AND PECULIARITIES OF BRITISH PLANTS, AND ON THE DERIVATIONS OF THEIR LATIN NAMES.

By T. B. Hall.

(Continued from p. 309.)

Anemone.—From ανεμος, wind; being readily agitated, or its petals easily scattered, as noticed in Ovid, *Met.*; and hence the poetical allusion of Sir W. Jones—

> "Youth, like a thin Anemone, displays
> His silken leaf, and in a morn decays."

Or from many of the species growing in exposed situations.

Anemone nemorosa, Wood Anemone, Wood Nymph, Wind-flower.—The flowers fold up in a curious manner, and bend downwards against rain. The whole plant is acrid. Goats and Sheep eat it, but it is apt to disorder the latter violently. Horses, Cows, and Swine refuse it. The recent flowers are poisonous, and the plant yields an acrid, volatile principle, so corrosive as to be used externally instead of Cantharides. It is also serviceable in head-aches, tertian agues, and rheumatic gout. A leaf of this plant, with *Puccinia anemones* growing on its under surface, was mistaken by Dr. Dillenius for a species of Fern, and was by him figured and described as such, in his edition of Ray's *Synopsis*, p. 124, t. 3, fig. 1., under the name of *Filix lobata, globulis, pulverulentis undique aspersa*. The original specimen, from which the drawing was made, is still preserved in

the Bobartian Herbarium, in the Library of the Oxford Botanic Garden. The roots are sometimes attacked by a minute Fungus, *Peziza tuberosa*, which is very destructive to them. By garden culture the stamens become transformed into supernumerary petals, and thus it attracts the admiration of the florists more than when in its natural shades it merely affects the "*simplex munditiis*." As the Wood Anemone is one of our early spring plants, I cannot help extracting the following lines from Dr. WITHERING on this subject:—" The love of flowers seems a naturally-implanted passion, without any alloy; but, perhaps, it is the early flowers of spring that always bring with them the greatest degree of pleasure, and our affections seem immediately to expand at the sight of the first opening blossom, however humble its race may be. It is not intrinsic beauty, or splendour, that so charms us, for the fair maids of spring cannot compete with the grander matrons of the advanced year; they would be unheeded, perhaps lost, in the rosy bowers of summer and of autumn; no, it is our first meeting with a long-lost friend, the reviving glow of a natural affection, that so warms us at this season: to maturity they give pleasure as a harbinger of the renewal of life, a signal of awakening Nature, or of a higher promise: to youth, they are expanding being, opening years, hilarity, and joy. With summer flowers we seem to live as with our neighbours, in harmony and good-will; but spring flowers are cherished as private friendships." Though the most splendid varieties of Anemonies or Wind-flowers are derived from exotic species, which beautifully enamel the meadows of Greece, our native ornament of the lonely thicket cannot fail to engage a due degree of admiration—

> " Where thickly strewed in woodland bowers
> Anemonies their stars unfold."

Anemone pulsatilla, Pasque-flower Anemone.—GERARDE expressly informs us that he himself was " moved to name" this the Pasque-flower, or Easter-flower, because of the time of its appearance. There is, therefore, no occasion to seek an explanation of this name in the reported use of the flowers for colouring the Paschal eggs of the Catholics, or the Scotch; especially as the flowers are said to yield a green, not a purple dye. The root is sweet according to HALLER, though the herb itself is highly acrid, and blisters the skin. Goats and Sheep eat it. Horses, Cows, and Swine refuse it. It is sometimes admitted into gardens, the flowers being very handsome, purple, and externally silky.

Anemone Apennina, Blue Mountain Anemone.—This is at least as worthy of the florist's attention as some other species. Its elegant bright blue flowers would prove ornamental to the shrubbery.

Angelica.—Named Angelic from its cordial and medicinal properties.

Angelica Archangelica, Garden Angelica, Candied Angelica.—A well-known

article in confectionary consists of the prepared stalks of this plant, and in that state is agreeable; otherwise, the flavour, though aromatic, is too powerful and pungent to be pleasant. It is called *Archangelica*, αρχη implying its imagined superiority in virtue over the following species. Of the antipestilential virtues of the root, those who wish to be informed, will find amusement, at least, in old Gerarde.

Angelica sylvestris, Wild Angelica.—It is warm, acrid, bitter, and aromatic; but the cultivated kind possessing these properties in a higher degree, this has been long neglected. Cows, Goats, and Swine eat it. Horses refuse it.

Anthemis.—Ανθεμις, from ανθος, a flower, because it bears an abundance of flowers.

Anthemis maritima, Sea Chamomile.—The flowers smell like Tansy; the leaves like Mugwort.

Anthemis nobilis, Common Chamomile, Sweet Chamomile.—The leaves and flowers have a strong, not ungrateful, aromatic smell, and a bitter nauseous taste, probably arising from an essential oil. Chamomile (which may be easily propagated by slips planted about a foot apart from each other) was formerly used as a cover for walks, odoriferous to the tread, and which, when mowed and rolled, looked well for some time, but, being subject to decay in large patches, they have been abandoned as unsightly. Varieties with double flowers, whose yellow tubular florets are, entirely or partially, transformed into white ligulate ones, are common in gardens; the discoid variety, destitute of rays, is more rare. The latter, perhaps, ought to be preferred for medical use; the double white flowers being now acknowledged to be weaker than in a natural state. Every part of the plant is intensely bitter, and gratefully aromatic, especially the flowers, whose stomachic and tonic powers are justly celebrated. Chamomile is derived from χαμαι, dwarf, and μηλον, an Apple, because the plant smells like Apples, or rather like Quinces.

Anthemis arvensis, Corn Chamomile, White Ox-eye.—The herbage has little or no smell, but the flowers are pleasantly scented.

Anthemis cotula, Stinking Chamomile or Mayweed.—Toads are said to be partial to this plant. It is very ungrateful and displeasing to Bees. Goats and Sheep are not fond of it. Horses, Cows, and Swine refuse it. It frequently blisters the skin of reapers, and of children who happen to gather it; the acrimony is occasioned by an exudation from minute glands perceptible with a microscope. It is one of the troublesome weeds that overrun Corn-fields, and ought to be extirpated by more diligent husbandry.

Anthemis tinctoria, Ox-eye Chamomile, Yellow Ox-eye.—The flowers afford a remarkably clear and good yellow dye. Those of *Chrysanthemum segetum* resemble them much in appearance, but experience proves that they will not

answer the same purpose. Horses and Goats eat it. Sheep are not fond of it. Cows and Swine refuse it.

Anthericum.—Ανθερικος, from ανθος, a flower, and ρηχος, a wall or precipice, applied by the Greeks to the stem of the Asphodel.

Anthericum serotinum, Mountain Spiderwort.—The specific name, which is incorrect for a plant blossoming in June, seems to have originated in a confusion of synonyms between this *Anthericum* and *Narcissus serotinus* of *Clus. Hist.*, Vol. 1., 162, f. copied in John Banhin's *Historia*, and there placed with our *Anthericum.*

Anthoxanthum.—From ανθος ανθων, flower of flowers; from its agreeable fragrance; or from ανθος, a flower, and ξανθος, yellow; from the yellowish hue of the spikes, especially in age.

Anthoxanthum odoratum, Spring-grass, Sweet-scented Vernal-grass.—This is one of our earliest Grasses, and principally occasions the delightful smell so peculiar to new-mown hay; hence its name of *odoratum*, or sweet-scented. If the leaves are gathered and held in the hand a few minutes, they exhale a grateful odour, similar to that of Woodruff (*Asperula odorata*). Boccone states that a distilled water may be prepared from it as the vehicle of some perfumes. If it be gathered while in flower, wrapped in a paper, and carried in the pocket, it retains the smell of new-mown hay for a long time. This fragrance depends, according to Vogel, upon the presence of benzoic acid. Mr. Thompson ingeniously observes, that as the odours of leaves depend chiefly on the exhalation of their essential oil, they are often regulated by circumstances affecting the excretory ducts of the follicular glands. Thus the duct being closed by the pressure of the cells, turgid with sap, in the fresh stem and leaf of *Anthoxanthum odoratum*, no odour is perceived; but it opens when these cells shrink, as the Grass dries, and then the agreeable perfume peculiar to new hay is exhaled. Cows, Goats, Sheep, and Horses eat it. It abounds chiefly in wet lands, flourishing in a peculiar manner on peat bogs. Mr. Sinclair, one of the highest authorities on this subject, states that "its merits in respect to early growth, continuing to vegetate and throw up flowering stalks till the end of autumn, and its hardy and permanent nature, sufficiently uphold its claim to a place in the composition of all permanent pastures. The superior nutritive qualities of its lattermath are a great recommendation for the purpose of grazing, the stalks being of but little utility, as they are generally left untouched by the cattle, provided there is a sufficiency of herbage." The valves of the blossom adhere to the seed when it is ripe, and the jointed awn by its spiral contortions through the alternate moisture and dryness of the air, assisted by the awn and the hairs which cover the valves, which from the same cause act as so many levers, separates it from the receptacle,

and lifts it out of the calyx, at a time when the spike is necessarily kept in an erect situation by a throng of taller Grasses surrounding them. A most beautiful and curious contrivance of Nature, without which, or some similar provision, the seed in wet seasons would be apt to vegetate in the husks, and the young plants in consequence become abortive.—Rev. J. SWAYNE.

Anthriscus.—Ανθρισκος, from ανθρησκα, flowers.

Anthriscus vulgaris, Common Beaked Parsley, Rough Chervil.—MILLER tells us there have been some instances of serious ill effect from this plant when taken in soups by mistake. CURTIS obverves that when luxuriant, as in moist situations, it affects somewhat the appearance of Hemlock (*Conium maculatum*), but may be distinguished from it by its leaves being slightly hairy, more finely divided and of a paler green ; the absence of the dark spots on the stem, and also the absence of a general involucrum, will serve readily to distinguish this plant ; the seeds in Hemlock are smooth, but in this plant rough, nor has it the strong disagreeable smell of Hemlock, but more resembles that of the Common Chervil, to which it is in habit somewhat allied.

Anthyllis.—From ανθος, a flower, and ιουλος, a beard or down ; from the downy calyxes ; or from ανθυλλις, diminutive of ανθος, a flower.

Anthyllis vulneraria, Kidney Vetch, Ladies'-finger, Lamb-toe.—As a vulnerary, its utility is at least problematical ; though in THRELKELD's time (1727) it was regularly sold in Dublin market "by the name of Stanch, being astringent." A yellow dye may be obtained from it. Where the soil was a reddish Clay, LINNÆUS remarked the blossoms to be red, but in white Clay, white. In Portugal WITHERING states to have always found them red. In England, most commonly, as the rustic poet observes,—

> "The yellow Lamb-toe I have often got,
> Sweet creeping o'er the banks in sunny time."

Goats and Cows eat it, and the herbage is said to afford good pasturage for Sheep. Though not in cultivation, Mr. SALISBURY considers it well worth attention, as, where it flourishes most (in calcareous soil), Cows produce better milk and in greater quantity. GESNER, it appears, first raised the report of the vulnerary properties of this plant, which perhaps, like other soft and downy applications, may, on an emergency, staunch the blood of a rustic wound, and give Nature and a good constitution time to effect a cure.

CORRESPONDENCE.

Notes on the Habits of the Dormouse.

To the Editor of the Naturalist.

Sir,—The little Dormouse (*Myoxus avellanarius*) alluded to by my worthy friend Mr. J.D. Salmon, in the February number of *The Naturalist* (p. 104), is yet alive and well. It came to me from him in Sussex, on the 23rd of December last, a distance of 140 miles, apparently but little disturbed by the long and tedious ride. From that time till the 1st of April, 1838, it slept in its snug dormitory—a deal box lined with wood—when it awoke, and readily ate of apples and nuts. It is easily alarmed, being more timid than tame, but shews no signs of anger on being taken in the hand. As it sleeps the greater part of the day, I cannot then closely watch its habits; but towards evening it wakes up, and is very lively and frolicsome, running, on being let out of its cage, up the bell-rope, where it will sit for hours in the folds of the knot, timidly watching our movements.

Habits of the Red-throated Diver.

On Friday, the 20th of April, a villager brought me a very fine specimen of the Red-throated Diver, or "Rain Goose," which he caught floundering—or "flopping," as he termed it—in a ploughed field in the parish of Boughton. Though uninjured, it was easily captured, not being able to take flight from the ground. Wishing to keep it alive a few days, till I could dispatch it to a friend, I placed it in a wide shallow tub of soft water, and gave it some live fish. It appeared very lively and perfectly at ease, swimming about, diving, and preening its feathers. It was very fierce on being approached, darting its sharp beak at every thing that came near. Two or three of my Fowls occasionally jumped on the sides of the tub, when it quacked loudly, and flew over the edge of its bath in its efforts to punish the intruders. A little Dog was made to repent indulging its curiosity, and to retreat from my strange pet much more nimbly than it came. On Saturday night it died. Since then another specimen has been taken in a field seven miles from this place. Is it not an unusual thing for these aquatic birds to be seen so late, and here at all, as we are thirty or forty miles from the sea?—My bird answered to Bewick's description, except that the neck-feathers were not so dark as his figred supecimen.

Query respecting the Oozing of Water from the Walnut-tree.

On Thursday last I observed, varying from four to six feet from the trunks of

two very fine Walnut-trees, little risings of moisture, like small springs issuing from the Gravel. Between the trees, about twenty feet from each, one much larger than the rest induced me to ascertain the cause, when, on digging down about eighteen inches, I found the bark of the root had given way, and the sap was rapidly oozing out. I counted from the two trees no less than nine springs, some more copious than the others, yet all flowing freely. On Sunday the spots were still very moist, but did not show signs of being on the increase. Can you oblige me, in one of your future numbers, by stating a remedy for this dangerous draining of two fine old useful and ornamental friends?

As a constant reader and admirer of your periodical, I take the liberty of forwarding you the preceding communications. Should they be worthy a place in the pages of *The Naturalist*, I shall feel pleasure in having added a mite to so excellent a Journal. Should they be considered inadmissible, I must request the favour of your pardon, and with all due submission subscribe myself as

Yours, most respectfully,

Stoke Ferry, Norfolk, RICHARD PIGOTT.
May 14, 1838.

[The eruption alluded to as observed in the trunks and roots of the Walnut-trees, probably arises from a disease scarcely to be subdued by local applications, a method, however, which would be as well tried, since no harm could ensue. An adhesive fluid or plaister might answer the purpose, but it is impossible to supply definite information on this head without inspecting the invalids. We should be glad to learn the experience of any correspondent in the matter.—For the above interesting communications we beg to return thanks, and to express a hope that Mr. PIGOTT will become a frequent contributor to the pages of *The Naturalist*.—ED.]

CHAPTER OF CRITICISM.

ON THE FORMATION OF PEARL.

To the Editor of the Naturalist.

Doncaster, *May* 17, 1838.

DEAR SIR,—At the conclusion of a very interesting lecture by Mr. EDWIN LANKESTER, at our Lyceum, the chairman, Mr. MOREY, complimented him on its originality, and in particular for the novelty and importance of his remarks

on the formation of Pearl. I consider the lecture very talented, and that it was delivered in a masterly manner; yet on the subject of the process by which Pearls are formed, I am not aware that Mr. LANKESTER promulgated any thing new. His statement was to the effect that the Pearl was produced when the shell was injured, and that, therefore, this beautiful and delicate gem, so highly prized, is the result of disease. This, I believe, is the generally-received opinion; but I have never met with a sufficiently clear account of the process of the formation of Pearls, to explain their peculiar structure. I admit that they are a secretion of gelatine mixed with nacreous or pearly matter, which, when combined, impart to this substance its hardness, smoothness, and delicate brilliant whiteness, rendering it so fit an ornament for the fair daughters of EVE, and emblematical of the purity and chastity of their minds—the beings whom Nature has formed in her choicest mould! or, as the rustic poet has expressed it—

> " Her 'prentice hand she tried on Man,
> And then she made the lasses, O."

But to proceed. I have examined many Pearls, both from the Oyster and the Muscle, making sections from them, in order to ascertain the *modus operandi;* and before giving my own opinion on the subject, I would premise, that when the Pearl is sawn through, the surfaces show a number of concentric laminæ, beginning with a small *nucleus*, and enlarging each successive layer, like a number of watch-glasses, the smallest being the central one. These spherical laminæ are all of similar thickness, and in some instances may be easily separated. It is asserted by naturalists, that the object of the fish in producing the Pearl, is for the purpose of repairing the shell; unfortunately for their theory, the Pearl is generally found lying snugly under the lower portion of the Muscle which connects the hinges of the shells; and if produced early, prior to the full growth of the Oyster, &c., the Pearl is often found imbedded in the flesh. From these facts, it seems probable that the formation of Pearl bears a strong analogy to that of *calculi*, and that they owe their peculiar beauty to their locality, being formed of a similar substance (but in a more concrete and compact manner) as the inner surfaces of the shells of both the Oyster and Muscle. It is possible—as I have seen three or four different-sized Pearls from one Oyster—that they are the result of some solvent secreted by the fish, which acts on the nacreous portion of the shell, liquifying it; and as all fluids assume a spherical shape, more or less, the dissolved pearly matter, obeying this law, takes a similar form, and, when hard, retains the partially spherical shape. Analogy is strongly in favour of this theory, as we find the *biliary calculi* in the human gall-bladder often nearly spherical, and they are nearly hollow; but even when so, their edges indicate

a crystalline structure, and appear as if the inspissated bile had suddenly concreted.

I am, dear Sir, yours truly,

To NEVILLE WOOD, Esq. J. L. LEVISON.

THE SCIENTIFIC NAME OF THE PIED WAGTAIL.

To the Editor of the Naturalist.

MY DEAR SIR,—I perceive that Mr. THOMPSON, in the *Annals of Natural History* (p. 181), appears to believe that the Linnæan appellation, *Motacilla alba*, should be retained for our Pied Wagtail, because "the two characters which form the description of *M. alba* in the *Systema Naturæ* are found in our bird. These are, '*pectore nigro, rectricibus duabus lateralibus dimidiato obliquè albis.*'" I cannot see the force of this argument. It is pretty evident that *ours* was *not* the Wagtail LINNÆUS described under the name of *M. alba*; and therefore, however near it may approach to the TRUE *M. alba*, if it be really a distinct species, it ought certainly to loose that appellation. Mr. GOULD appears certainly correct here; but why he has deemed it necessary to coin a *new* name (*M. Yarrellii*), I know not. The *British species* has been described more than once (previous to Mr. GOULD's truly laudable discovery) under the name of *M. maculosa*, which, being perfectly appropriate, I see no reason for altering. Our nomenclature is already sufficiently stocked with synonyms.

Believe me, yours sincerely,

Bewsey House, Warrington, PETER RYLANDS.
May 4, 1838.

RELATIVE ADVANTAGES OF THE LINNÆAN AND NATURAL SYSTEMS OF BOTANY.

To the Editor of the Naturalist.

MY DEAR SIR,—When I sent you a notice of the most remarkable works of the present day on British Botany (p. 68), I had no intention of provoking Mr. LANKESTER into a discussion of the merits of the natural system, though I could almost swear, from the list of books *he* had given you, that he must have been a pupil of Dr. LINDLEY's. I should not shrink from taking up the gauntlet he now seems to have thrown down for me, if it were possible to reply at length without allusion to *living authors*. But Dr. LINDLEY is brought forward so prominently, and being, as is well known, the great champion of the natural system in Britain, while I was apparently combating with Mr. LANKESTER, I should in reality be attacking Dr. LINDLEY; and thus my literary spear, if good for any thing, must

be long enough to pierce through not only the "six tough bull-hides" of Mr. LANKESTER's shield, but also the "solid brass" (I mean no sarcasm) of the learned professor's. In fact I should of necessity have to make extracts from Dr. LINDLEY's botanical works, and comment on the unnecessary severity of language he has employed towards the Linnæan system and its advocates on various occasions, infusing what I consider to be the same unjust, and, I still think, unphilosophical spirit into his pupils. Inquiry into the merits of the Linnæan system is not once thought of by the modern botanist of a certain school, who is *taught* to despise it as worse than useless. Thus Mr. LANKESTER, in giving a notice of the works published in the present day for the botanical student—in which, surely, impartiality required that Linnæan publications, written, as he himself says, "in a pleasing style, calculated to allure to the study of Botany," should not be placed *below zero*—huddles a few of them together in a sort of postscript, and goes out of his way to intimate that the system of LINNÆUS must be *discarded*, as "prejudicial to the advancement of the science of Botany." In his more recent paper in *The Naturalist* (p. 175), Mr. LANKESTER still labours to show that the Linnæan system is "exploded," and that "its advocates belong to a school whose views are very far *behind* the advance made by the science of Botany." This style of astounding *assertion* is only exceeded by the *great master* himself, who, in his *Synopsis of the British Flora*, says :—"It [the Linnæan system] is repudiated *every where* by the rising generation;" that is, I presume, if they learn Botany at the London University; he adds that it "*ought to be excluded* from all courses of public instruction by every governing body in this country." Then, after all, it does linger *somewhere*. Surely it is not countenanced by the Regius Professor of Botany at Glasgow !* But seriously, where is the *evidence* of the injury that the interests of Botany have sustained from the promulgation of the Linnæan system ? Botany has an army of votaries *now*, but BURNETT tells us that in his younger days the medical student was a laughing-stock to his compeers if he troubled himself with Botany. From the moment that the herbarium of LINNÆUS touched this country, it must be obvious to all acquainted with the subject, that the study of Botany received an impulse which, by increasing its admirers on all sides, has led to its present prosperity. Did Sir JAMES SMITH injure the interests of Botany when he brought this valuable collection to England ? and has the use he made of its stores, in the publication of his *English Botany*, and his hitherto unequalled *English Flora*, been so injurious to the spread of the science ? Are we also meekly to admit as a fact, that Sir W. J. HOOKER, in disseminating over the country *three editions* of his *British Flora*, arranged on this "discarded" and

* Sir WM. JACKSON HOOKER, L.L.D., &c.—ED.

"exploded" system, which is "every where repudiated," has really, according to Dr. LINDLEY's *dictum*, interfered with the public good?* The student of the natural system may affirm this if he pleases, but I still contend that his constant *assumption* and querulous repetition of the injurious tendency of the Linnæan system is "unphilosophical," since it is no sound argument that because on certain points the Linnæan system may be defective, *therefore* the natural system must be its superior in *all*. Has the natural system no hope of success unless it break ground by constantly impugning the Linnæan? It is indeed passing strange that while Dr. LINDLEY affirms that the latter is "repudiated every where," and Mr. LANKESTER argues that it is "injurious," and has therefore been "exploded," both these gentlemen should think and act as if they had a *living* and not a *dead* Lion at their feet. This seems incomprehensible, unless Mr. LANKESTER has let the Cat out when he hints that there is a "want of demand" for the works on the natural system. Be this as it may, something seems wrong; and I am led to infer, that *in practice* the disciples of the natural system find it rather unmanageable; for even Mr. LANKESTER appears to shrink from "the hills and vales of our own island," and rather unbotanically—he will excuse me for saying so—talks disparagingly of the "*tiny weed* that springs beneath our feet." He seems to prefer the grander and more specious *groups* of the green-house and conservatory, where I agree with him he will find the system he espouses of most service.

If you like to print what I have written above—which is all the reply I feel disposed to make—in the Correspondence or Criticism of *The Naturalist*, you are at perfect liberty to do so. I have no time at present to enter into an extensive review of the natural system; and if I had, it would take up more room, probably, than you could spare, and heartily tire the majority of your readers before the inquiry was terminated. You see I say not a word against the natural system—I leave it to stand or make its way on *its own merits*. I admire the energy of its champions, and applaud their untiring researches into structure and affinities; but I must reprehend the tone of contempt in which they almost invariably allude to those botanists who, like Dr. JOHNSTON, in his interesting and excellent *Flora of Berwick*, still presume to hope that the Linnæan system will yet continue something more than one of those nonentities of which all but the semblance of its existence has passed away. I do not say that this language is applied *personally*, but the implication is perpetually displayed—that a system so trifling and superficial as we are thus, *vi et armis*, compelled to suppose the Linnæan to be, can only be supported by trifling and superficial observers. This mode of conducting the argument is uncourteous, and has the

* See *Syn. Brit. Flora*, Preface, p. vii.

effect of creating a prejudice which precludes all cool investigation, and at once converts the botanical student into a flaming partizan.

Believe me,

Yours very truly,

Dryadville Cottage, near Worcester, EDWIN LEES.
May 4, 1838.

REVIEWS OF NEW PUBLICATIONS.

The Natural History of Quadrupeds and Whales; being the Article "Mammalia," from the Seventh Edition of the "Encyclopædia Britannica." With above 150 illustrations. By JAMES WILSON, F.R.S.E., M.W.S., &c. Edinburgh: *A. and C. Black; Simpkin and Co.*, London; *John Cumming*, Dublin. 1837. 4to. pp. 120.

IN our last number (p. 332) we reviewed, at some length, Professor PHILLIPS'S geological treatise, as republished from the *Encyclopædia Britannica.* We here have a reprint of another article from the same valuable work, from the pen of a well-known zoologist. Our retrospect of the volume must be as rapid as the author's review of the animal kingdom, but the work is too excellent and too carefully written to be discharged with a mere passing notice of general commendation.

After furnishing a synopsis of a few of the more important mammalogical systems, our author enters fairly upon his subject, with the arrangement of CUVIER. In stating (p. 86), as a general characteristic of the Mammalia, that their colour is lighter underneath than above, it is by no means intended to affirm, we presume, that the circumstance is confined to the class, or even to the animal kingdom. The same may be said of the leaves of plants, which are always darkest on the side most fully exposed to the light. Whether the same cause operates in animals to produce a similar effect, must be considered very doubtful. At p. 86 it is stated, that the young of Mammalia are frequently more elegantly attired than adults, which is perfectly true; but the rule placed in juxta-position, that "the early plumage of birds is always more dingy and obscure than that of adults," is not without its exceptions. The young of some Woodpeckers, for instance, have bright scarlet feathers in parts where the adults are perfectly destitute of them. "Melanism [black varieties] is more frequent in warm countries, albinism [white varieties] in cold ones, and the former is much rarer than the latter." Doubtless; although we have seen whole parks stocked with black Rabbits in England, and have known Coalhoods (or "Bullfinches") and Goldwings ("Goldfinches") turn black in a temperate climate, from feeding too profusely on a heating diet. It seems most probable that the seasonal changes

of colour occurring in the Alpine Hare, the Ptarmigan, and other Arctic animals, are the effect of temperature; and in our opinion the existence of pure white birds in the tropics, and jet-black Ravens in the bleak north, is no argument to the contrary, but merely proves—what every one knows—that all birds are not organised alike.

From those authors who would class Man among the brutes, and technically characterise him as differing in mere external points, we entirely dissent. It is by the possession of moral and especially of reflective faculties, that the human race so transcendentally surpasses all other portions of the animal kingdom—by the addition of those alone that Man is enabled to become lord of the earth. We cannot but smile when we see him characterized, in two lines, as "walking erect," "possessing hands to the anterior extremities only," &c., and must pity those who take so low a view of human nature—of a race which on this earth deserves the deepest attention, and which will hereafter, we confidently believe, continue to advance in wisdom and in happiness through all eternity.

Father Vincent Marie states that the Wanderou (*Macacus silenus*) "is easily trained to the performance of a variety of ceremonies, grimaces, and affected courtesies." In reply to this our author, with a touch of the quiet humour which frequently enlivens his pages, observes that he never had the pleasure of knowing more than one living individual of the species, and that "the only piece of 'affected courtesy' it ever exhibited, consisted in nearly biting off the calf of a negro's leg." —p. 93. The younger St. Hilaire informs us that the Sapajous (*Cebus*) indulge in abstract ideas, his proof being that he once observed one of these animals, which had met with an unusually hard nut, descend from the top of a wooden cage, and crack the said nut by bruising it against an iron bar. For the same reason, we put in a claim for the Garden Tit's "indulging in abstract ideas," since, when it meets with an unusually hard nut, it places it in a chink, and there hammers at it till it arrives at the kernel! "It is delightful," remarks Mr. Wilson, "to find Metaphysics thus combined with Natural History."—p. 95. Whether, in recording that the physiognomy of the Saimiri, or Squirrel-monkey (*Saguinus sciureus*), is "extremely like that of a human infant, but much more pleasing than that of many," our author intended any compliment to the taste of the ladies, we must leave to the sagacity of our female readers to determine. The same animal is remarkably attached to its offspring, and Geoffroy St. Hilaire observes that the large development of the posterior lobe of the brain corresponds with the affection.

The Lemur family is next treated of; but as these animals have been described minutely in an early part of our second volume (pp. 1—13 and 189—203), we shall not tarry here.—The Hedgehog, according to Pallas, feeds on the Blistering-beetle (*Cantharis*) with impunity, and, adds Mr. Wilson, it has been known

to resist large doses of Prussic acid.—Moles are extremely voracious. Their appetite for food, says St. Hilaire, amounts to actual phrensy :—

"When kept for a time in a state of abstinence they become outrageous, and will dart with violence upon whatever prey is then presented,—plunging their heads into the abdomen of birds and other animals, and satiating themselves with blood. They have been observed to refuse Toads, but to seize upon Frogs with avidity. With such violent propensities it may be easily conceived that they soon die when debarred from food. At the same time their appetites are not entirely carnivorous; at least several authors allege that they occasionally eat various tender and succulent roots, and the bulbs of *Colchicum*. Though deemed very injurious in gardens, and persecuted by farmers even in the open grounds, they do not want advocates who espouse their cause as useful agents in the economy of Nature; and their undoubted destruction of grubs and Mole crickets must prove beneficial to Agriculture. The female, indeed, while furnishing her nursery, is a somewhat too active reaper,—402 young stalks of Corn, with the leaves entire, having been counted in her nuptial chamber."—p. 104.

The animals called Tanrecs (*Centenes*), and which are partially covered with prickles, are said to become torpid in summer—an anomaly, certainly, to be accounted for on no known principles. Speaking of the food of Bears, we learn (p. 105) that "Sir Stamford Raffles possessed a Malay Bear (*Ursus Malayanus*) which gave proof of its refined appetite, by refusing to eat anything but mangosteens, or to drink any other wine than champagne."

In discussing the nomenclature of the Weasel family, our author justly remarks, that "whenever a Linnæan genus is raised to the rank of a family, the original generic title should still be retained as indicative of one of the restricted groups." To this we beg to move an amendment, viz. that that restricted genus be invariably the typical one.

Into the investigation respecting the original stock of the Dog we cannot enter, further than to observe that our author believes it to have been either the Wolf or the Jackal, or perhaps both. Professor Bell is in favour of the former animal. It is said that Wolves kept amongst Dogs soon learn to bark, and, on the other hand, that Dogs, run wild, lose the talent in an equally short time.

Bruce informs us that about Libanus, Syria, Northern Asia, and the vicinity of Algiers, Hyænas live chiefly on large succulent bulbous roots, especially those of Fritillarias, &c., and that he has known large patches of fields turned up by them in searching for Onions and other plants. He adds, that these were selected with such care, that, after having been peeled, if any small decayed spot became visible, they were refused. The above-mentioned author one day locked up a Goat, a kid, and a lamb, with a Barbary Hyæna which had fasted, and in the evening he found the intended victims not only alive but quite uninjured. "He repeated the experiment, however, on another occasion, during the night, with a young Ass, a Goat, and a Fox, and the next morning he was, not unreasonably, astonished to find the whole of them not only killed, but actually eaten, with the exception of some of the Ass's bones! This was pretty well for an animal so curious in bulbous roots." (pp. 119—20).

Mr. Wilson agrees with Temminck in believing the Gloved Cat (*Felis maniculata*) of Northern Africa to be the origin of our domestic breed, contrary to the general opinion in favour of the Wild Cat (*F. catus*) of Britain.—Of the Opossums it is remarked, that "their intelligence is limited, a fact in curious conformity with the entire absence of all folds or convolutions of the brain, and according with the theory of M. Desmoulins [but which originated with Dr. Gall.—Ed.] that [*cæteris paribus.*—Ed.] the intellectual faculties are in the direct ratio of the extent of the cerebral surfaces." (p. 127).—The Hamster (*Cricetus vulgaris*), like other hybernating animals, is very fat on the approach of winter, and becomes sadly emaciated when it awakes in spring. During that period of inactivity, the pulsations of the heart are "few and far between," the intestines are wholly devoid of irritability, and the fat of the creature has the appearance of being coagulated. In this, as in other cases where no food is taken in the ordinary way, no doubt the fat affords ample nourishment to the animal in common seasons; but if the rigours of winter should ever be prolonged considerably beyond their due bounds, so as to exhaust the fat, the animal would assuredly sleep to wake no more.

The flesh of the Capybara or Water-hog (*Hydrochærus capybara*) of South America, says our author, is excellent, and was eaten by the missionary monks during Lent with their Turtle, "on the score, it was presumed, of its amphibious habits. Precise views of the exact nature of all Mammalia are sometimes inconvenient."

A specimen of the Malay Tapir (*Tapir Indicus*) described by Sir Stamford Raffles, "was frequently observed to enter a pond and walk along the bottom under water, but without any exercise of the ordinary mode of swimming." (p. 151). What, then, becomes of the much-talked-of impossibility of the Dipper's walking at the bottom of the water? If the above fact neither proves the occurrence of the latter phenomenon, nor causes every argument on the opposite side to "vanish into thin air," it at least deprives the idea of its supposed absurdity.

Speaking of the equine race, Mr. Wilson observes:—

"A remarkable distinction is said to exist between the temper of the South-American and Asiatic wild Horses. It is this. At whatever age the former are caught, they may be rendered, in a measure, fit for the service of Man almost in a few days, whereas the latter can only be tamed when taken young, and frequently show themselves in after life to have been but half subdued. Does not this go far to prove that the one is the genuine original—the other but a rebel race?"—p. 152.

In our opinion it does not. We should make exactly an opposite induction, namely, that the Asiatic are the genuine originals—an opinion supported, we may observe, by the scriptural account of the peopling of the world.

The descriptions of Cetaceous animals (Whales, &c. &c.) finish the volume, but we must now hasten to a close.

This work, instead of being published uniform with the other treatises of the series, is merely a fresh impression of the types as set up for the *Encyclopædia*, obviously for the convenience of inserting the quarto plates. The higher groups and the genera are amply characterized, and a few of "the more interesting species" of each genus are described. The book is written in a popular and attractive manner, and is well calculated to impart a sound elementary knowledge of the subject treated. The plates are very superior to the common run, being evidently executed with a view to scientific accuracy, and being generally devoid of that stiff formal expression so common in engravings of a similar kind, where the originals might indeed be supposed to be alive, but aware that they were sitting for their pictures. We shall shortly have the pleasure of returning to Mr. Wilson as an author on another branch of Natural History.

Introduction to the Modern Classification of Insects. By J. O. Westwood, F.L.S., &c. Part I. May, 1838. London: *Longman and Co.*

When we consider the vast number of species of insects which have already been discovered, and the extent and complexity of the divisions and sub-divisions under which it has been found necessary to arrange them, we shall readily admit the importance of works written to facilitate the acquirement of a knowledge of classification. For this end, Rœmer's *Genera Insectorum Linnæi, et Fabricii, iconibus illustrata*, Curtis's *British Entomology*, Wood's *Illustrations of the Linnæan Genera of Insects*, &c., have been published. But whilst there has been no scarcity of works illustrative of the genera, we have not at present any devoted more particularly to the orders and families. A good introduction to the Classification of Insects (which must of course include the characters, &c., of the higher divisions) has long been wanted. Mr. Westwood has determined to supply this desideratum, and perhaps there is no other British naturalist into whose hands we should as readily confide the execution of such a task. In a work which will require numerous figures for the illustration of the characters upon which a system is based, Mr. Westwood's long experience in the investigation of the structure of insects, and his excellent capacity as a delineator, give him an advantage over others that cannot be appreciated lightly. The first Part has not disappointed our expectations. It opens with "observations upon insects in general," in which the definitions proposed for this class of animals are discussed.

Linnæus defined *Insecta*—the fifth class of his *Systema Naturæ*—as comprising those animals "with a simple heart, white blood, and jointed antennæ." These he divided into seven orders, the last of which, *Aptera*, contained the Spiders, Crabs, Scorpions, Centipedes, Wood-lice, &c. &c., having no other claim to be thus associated together than the negative one upon which he based the order;

namely, *being destitute of wings.* FABRICIUS classed the Linnæan *Aptera* in various sections, but still considered them genuine insects. CUVIER was the first naturalist who held a different opinion. By his elaborate researches in Comparative Anatomy, he demonstrated that the Crabs and other allied genera (*Cancer*, *Oniscus*, and *Monoculus* of LINN.) "could not be retained amongst insects, inasmuch as they possessed a totally distinct system of respiration, breathing by means of bronchiæ, or gills; as well as a complete system of circulation: of these, therefore, he formed the class *Crustacea*, which has been regarded as distinct by all subsequent entomologists."—WESTW., *Intr.*, p. 2.

LAMARCK established on similar grounds another class, which he denominated *Arachnida*, and which included the Linnæan genera *Aranea*, *Scorpio*, *Phalangium*, *Acarus*, *Scolopendra*, *Julus*, *Lepisma*, *Podura*, and *Pediculus*.

LATREILLE (in his *last* system) regarded the Centipedes (genera *Scolopendra*, *Julus*, LINN.) as constituting a distinct class, which he denominated *Myriapoda*. He adopted CUVIER'S *Crustacea*, and LAMARCK'S *Arachnida*, with the exception of *Podura* and *Lepisma* (ord. *Thysanura*, LATR.), and *Pediculus* (ord. *Parasita*, LATR.), which he considered as true insects, and raised to the rank of orders.

Dr. LEACH'S system, with regard to the animals in question, differed little from LATREILLE'S. Under his *Insecta Ametabola* he classed *Thysanura* (LATR.) and *Anoplura* (*Parasita*, LATR.). LEACH considered the Mites as a distinct class, which he named *Acari*.

KIRBY and SPENCE divided the sub-kingd. *Annulosa* into three classes: *Crustacea* (CUV.), *Arachnida* (LAM.), and *Insecta* (LINN.), and included under the last the *Lepismæ*, *Pediculi*, *Acari*, and *Centipedes;* joined together under the single order *Aptera*, and characterised by respiring by tracheæ, and having no system of circulation. This classification is so objectionable, that it was likely to attract Mr. WESTWOOD'S notice: he remarks, accordingly, that

"The incongruous character of the groups thus associated together; the possession of the pulmonary sacs by *Thelyphonus*, which is thus placed amongst the Mites; the recent researches of M. DUGES on the respiratory organs of *Dysdera* and *Segestria* (clearly demonstrating that the respiratory system in *Arachnida* is not entitled to pre-eminence as a character of this class); and, lastly, the admission of Messrs. KIRBY and SPENCE themselves, that their order *Aptera* is not a natural, but merely a provisional one, and that the hexapod insects are to be regarded as more peculiary entitled to the denomination of insects, will, I trust, be considered as sufficient to authorise me in not adopting their views."—p. 3.

"Our system," says Dr. BURMEISTER, "is not acquainted with an order *Aptera*, which we have found in the majority of the others, as in every case it is artificial, and must embrace insects of the most dissimilar orders. The most distinct proof in support of this assertion is furnished by the circumstance that we find in the same family, winged and apterous genera contiguous together, and indeed, in many genera, the males winged, and the females apterous." He has

consequently placed the suctorial Lice (*Pediculidæ*) in the order *Hemiptera*, and the mandibulated Lice (*Nirmidæ*) and Spring-tailed insects (*Lepismidæ*) in *Neuroptera!* Mr. WESTWOOD justly objects to this unwarrantable innovation. He is of opinion that Dr. BURMEISTER "has been led to adopt this arrangement by giving too slight a weight to the organs of flight;" and in the proofs cited in favour of his system, Mr. WESTWOOD "can see but exceptions to a general rule, for which allowances ought to be made, and, consequently, as not warranting the introduction of entire groups of apterous animals into the class."—p. 6.

We now arrive at Mr. WESTWOOD's classification. He considers that insects may be defined to be

"Annulose animals breathing by tracheæ; having the head distinct; and provided in the adult state with six articulated legs; subject also to a series of moultings, previous to attaining perfection, whereby wings are ordinarily developed."—p. 1.

He thus excludes the entire *Arnetabola*, Auct. (*Myriapoda*, *Thysanura*, and *Parasita* of LATR., &c.), which he considers, with MAC LEAY, as constituting a distinct class, "having no metamorphosis, in the usual sense of the word, or only that kind of it the tendency of which is confined to an increase in the number of feet." In thus adopting MAC LEAY's classification, he wishes to be understood as having done so

"Because it leaves the true winged metamorphotic insects as distinct from the other groups, and without expressing any opinion upon the quinarian views of Mr. MAC LEAY, or upon the introduction of the *Vermes* amongst the *Arnetabola*."—p. 4.

After having determined (and we think justly) the limits of the class *Annulosa*, he proceeds to the structure of insects. The chapter devoted to this subject contains much interesting and well-condensed matter. We have not space to discuss the questions touched upon in his remarks on the "Distribution of Insects into Orders," but consider them well worthy of attention, although by no means convinced of their correctness in every respect. Then follows a list of works devoted to *Coleoptera*, and remarks on that order. We can only give a very brief summary of this part of the subject. LINNÆUS divided Coleopterous insects into the three following sections:—*Antennis clavatis extrorsum incrassatis; Antennis filiformibus;* and *Antennis setaceis.* OLIVIER distinguishes the primary sections of the order by the variations in the joints of the tarsi. The tarsal system was rejected by MAC LEAY, who proposed divisions founded upon the peculiarities of the larvæ. The application of this theory throughout the entire order, Mr. WESTWOOD considers impossible. In this opinion he is supported by KIRBY, who in the *Fauna Boreali Americana* considers that Mr. MAC LEAY's system cannot be adopted through the "mazy labyrinth" of Nature, and regards it as impossible "either to conceive or delineate it so as to maintain all its connexions undisturbed and unbroken. We must do it in a series, which can only

be a series of mutilations and dislocations." Mr. WESTWOOD therefore adopts the tarsal system; in which, however, he proposes several alterations. The following are his primary sections of the order *Coleoptera*:—

"1. *Pentemera*, in which all the tarsi are 5-jointed, the 4th being of ordinary size.

2. *Heteromera*, in which the four anterior tarsi are 5-jointed, and the two posterior 4-jointed.

3. *Pseudotetramera*, in which the tarsi are 5-jointed, but the 4th joint is exceedingly diminutive, and concealed between the lobes of the preceding.

4. *Pseudotrimera*, in which the tarsi are 4-jointed, the 3rd joint being very diminutive, and concealed between the lobes of the preceding."—p. 44.

A few pages of a "Generic Synopsis" are given, which is to be continued (separately paged) at the end of each monthly part, until complete. We do not doubt its being found useful, but are sorry to observe the defective system of nomenclature (in the families, &c.) which Mr. WESTWOOD has adopted. The terminations used to distinguish the rank of the groups are *idæ*, *ides*, and *idea*, which are manifestly too little varied to be of much service for the purpose intended.

The plate at the commencement is beautifully and accurately executed; and the work generally well got-up. We must, however, notice an evident negligence in the correction of the press; owing to which several errata (and some important ones) disfigure the pages. Thus at p. 3 we are informed that "by LATREILLE the Spring-tailed insects and Mites have been constantly regarded as belonging to the class of insects"; which is not true, as the *Acari* (Mites) are arranged by that author in his *Arachnida*. We presume that *Lice* are here meant; respecting which the above remark would be correct. Thus also at pp. 33—35 two sentences as they at present stand are intirely destitute of meaning. We are informed that "in the earlier editions of the *Systema Naturæ* it [the structure of the elytra] was even employed as its sole characteristic [*i. e.* of the Order]; so that the Grasshoppers, Cockroaches, and Earwigs were included in it; and *crown of the head, which he considered to be ocelli, but* LATREILLE, in the last edition of this work, &c. &c." And again:—"The simple ocelli are here wanting, except in *Paussus bucephalus*, and some of the small *Staphylinidæ*, in which DELMAN observed two tubercles *on the considered* them as mere tubercles." It is evident that the part we have *italicised* in the first sentence ought to have been inserted between "on the" and "considered" in the last. We trust that such blemishes will be avoided in future.

We have given Mr. WESTWOOD'S *Introduction* the above lengthy notice, as it afforded an opportunity for bringing under the view of our younger readers some of the first general details of entomological classification; and also as we think that the work well deserves being prominently reviewed.—P. R.

A Geographical and Comparative List of the Birds of Europe and North America. By CHARLES LUCIAN BONAPARTE, Prince of Musignano. London: *John Van Voorst*, 1, Paternoster-Row. 1838. pp. 67. 8vo. Cloth, lettered.

THE pages in this book are printed in double columns, with the European birds on one side, and the transatlantic species on the other, the whole being so arranged as to afford a distinct comparative estimate of the Ornithology of the two districts. The classification is the author's own, about to be brought more fully before the public at an early period. His divisions are into subclasses, orders, families, subfamilies, and genera. We must, however, postpone all criticism of the system till the appearance of the noble author's promised work.

As regards nomenclature, the specific names are those of LINNÆUS, or of the first describer after the learned Swede. Although our author makes it a rule, when in want of a name, always to ascertain whether an appropriate denomination is to be found in the writings of the older naturalists, he does not consider others bound so to do; and in no case does he deem it right to take any of the names of older authors, however great may be their merits, in preference to those given by LINNÆUS (preface, p. vi.). Thus far we agree with Prince BONAPARTE; the nomenclature of LINNÆUS is so universally familiar to every naturalist worthy the name, and, on the other hand, the works of older authors—whether fortunately or otherwise—are comparatively so little known, that to adopt the terms of the latter in preference to those of the former, would but beget confusion. When, however, the author's preface proceeds to observe that "we owe this compliment to that great man," we are entirely at issue with the prince. LINNÆUS, with a spirit which ought to be wholly unknown in science, refused to employ the names of his predecessors where they were good, and otherwise failed to do justice to those eminent naturalists who had so materially assisted his labours. We would, therefore, adopt the nomenclature of the learned Swede not as a compliment to that great man, but as a matter of convenience to ourselves.—It may be observed that the author has commenced all the specific names with capitals, in opposition to the usual custom. Capitals should be reserved to distinguish terms derived from proper names.—English names are altogether absent from the list.

We regret, with our author, that zoologists in general should have been so remiss in their attention to Ornithological Geography. In this department, however, the name of SWAINSON stands prominent. Prince BONAPARTE has published comparative lists of the birds of Rome and Philadelphia, in the *Nuovo Giornale de' Letterati*, afterwards printed as a separate tract at Pisa, in 1827. The present is likewise a welcome contribution to the same section of ornithological science. Whether considered as a comparative estimate, or as forming the

most complete catalogues extant of the birds of Europe and America, it is equally valuable to the ornithologist.

Essays on Natural History, chiefly Ornithology. By CHARLES WATERTON, Esq., author of "Wanderings in South America." With an Autobiography of the author, and a View of Walton Hall. London: *Longman and Co.* 1838. pp. lxxxiii., 312. 12mo. Cloth, lettered.

THESE essays are reprinted from the old series of the *Magazine of Natural History*, formerly edited by Mr. LOUDON, and are published at his expense. The only original portion of the volume, therefore, is the detailed, and of course highly interesting, biography of the author. This is valuable on account of the faithful manner in which circumstances are recorded which delicacy would have prompted a friend to omit, in writing the biography of a living author. For instance, at p. xiv., Mr. WATERTON observes that on looking at himself in the glass, he can see at once that his face is anything but comely, and adds in a note:—"A late worthy baronet in the North-Riding of Yorkshire, having taken up the *Wanderings*, and examined the representation of the nondescript with minute attention, 'Dear me!' said he, as he showed the engraving to his surrounding company, 'what a very extraordinary-looking man Mr. WATERTON must be!'"

The family of the WATERTONS, once influential, has resided at Walton Hall some centuries, and previously dwelt at Waterton in the Isle of Axeholme, in Lincolnshire. In their independence they seem determined to be islanders, the present family mansion being situated upon an island. The same spirit has determined Mr. W. not to take Sir ROBERT PEEL's oath respecting the Church Establishment.

"I don't believe that Sir ROBERT cared one fig's end whether the soul of a Catholic went up, after death, to the King of Brightness, or descended to the king of brimstone: his only aim seems to have been to secure to the Church by-law established, the full possession of the loaves and fishes. But as I have a vehement inclination to make a grab at these loaves and fishes, in order to distribute a large proportion of them to the poor of Great Britain, who have an undoubted claim to it, I do not intend to have my hands tied behind me: hence my positive refusal to swallow Sir ROBERT PEEL's* oath."—p. xix.

Mr. WATERTON possessed an inherent love of Nature almost from his earliest days, and his attachment appears to have grown with his years. He was born at Walton Hall, some five-and-fifty years ago. We have visited his beautiful and extensive Park, which is walled all round, and in which the sound of a gun is never heard; and consequently a more delightful spot for the true naturalist can hardly be conceived.

*"I do hereby disclaim, disavow, and solemnly abjure any intention to subvert the present Church Establishment within this realm," &c. (See Sir R. PEEL's oath.)

The essays are ever fresh, and will bear reading almost any number of times. We had marked several passages for criticism, but are obliged to conclude the present notice without further comment. We may, however, observe that we scarcely know any author better calculated to write on Natural History for all classes of readers than our amiable neighbour CHARLES WATERTON, Esq.

The Bee-Keeper's Manual; or Practical Hints on the Management and complete Preservation of the Honey Bee, and in particular in Collateral Hives. By HENRY TAYLOR. London: *R. Groombridge*, 6, Panyer-Alley, Paternoster-Row. 1838. pp. 78. 12mo.

WE have been much gratified by the perusal of this unassuming little volume. It is no compilation "got up" to fill the pocket of either author or publisher, being, on the contrary, a manual of the author's apiarian experience, supported, where desirable, by the opinions and facts of the most accredited writers on the subject. Every particular that can be desired by the young Bee-keeper, relative to the humane system, as developed in NUTT's collateral hives, will here be found in a compact and readable volume, illustrated by wood-cuts. It emanates from the press of Messrs. TAYLOR, of Red-Lion-Court.

Manual of British Botany; in which the orders and genera are arranged and described according to the Natural System of DE CANDOLLE; with a Series of Analytical Tables for the Assistance of the Student of the Plants indigenous to, or commonly cultivated in, Great Britain. By D. C. MACREIGHT, M.D., F.R.C.P., &c. &c. London: *John Churchill*, Princes-Street, Soho. 1838. pp. 296. post 8vo.

IT always gives us sincere pleasure to meet with new books for the assistance of the student—books which, without advancing Natural History immediately, will undoubtedly effect the same desirable object indirectly. Since, however, Dr. MACREIGHT, by the copiousness of his title-page—transcribed above—has judiciously abridged the labour of the reviewer, we need not expatiate on the volume further than by observing that, being a convenient pocket-volume, neatly printed, and carefully composed, it cannot but prove a valuable guide to the student of British plants. It is dedicated to Earl STANHOPE, President of the Medico-Botanical Society.

A Flora of the Neighbourhood of Reigate, Surrey; containing the Flowering Plants and Ferns. By GEORGE LUXFORD, A.L.S., F.B.S.E. London: *John Van Voorst*, Paternoster-Row; *W. Allingham*, Reigate. 1838. pp. 118. post 8vo.

Though mainly of local interest, this *Reigate Flora* is not entirely so; for, consisting exclusively of the results of the author's observation, or of that of friends on whom he can depend, it will be valued by every botanist interested in the geographical distribution of plants. It is beautifully printed, bound and lettered (by the author), and will be followed, in due time, by a supplement, containing plants collected about Reigate subsequent to the publication of the present catalogue. Mr. Luxford (formerly of Reigate, but now of London, printer) appears to be an ardent lover of Botany, and we are glad to find that he has received considerable literary and pecuniary support in his labours. Among the subscribers we notice the names of Countess Somers, Viscount Eastnor, Lady Cocks, Capt. Alsager, M.P., Mr. D. Cooper, Professor Don, Mr. Francis, Mr. J. E. Gray, Lady Jolliffe, Henry Kemble, Esq., M.P., Mr. G. B. Knowles, Mr. J. De C. Sowerby, Mr. N. B. Ward, Mr. F. Westcott, &c. &c. The volume is accompanied by a neat map, and is dedicated to the Linnæan Society.

A History of British Birds. By Wm. Yarrell, F.L.S., V.P.Z.S. London: *Van Voorst*, Paternoster-Row. Part vi., May, 1838.

This new number of Mr. Yarrell's work contains the Tithys Redstart, the Chats, the Locustell, the Reedlings, the Nightingale, and the Blackcapt and Garden Fauvets. Some of the wood-cuts are very excellent, but others much less so. The letter-press fully sustains the character for which we have before commended it.

The Tithys Redstart, according to Robert Ball and Wm. Thompson, Esqrs., occurs in Ireland, in addition to the other British localities mentioned by ornithologists. Our author is of opinion that the Whin Chat is decidedly migratory in Britain. He says:—

"Pennant thought they did not migrate, only shifted their quarters; but I am not aware of more than two authentic instances of the Whin Chat being seen here in winter. Mr. Neville Wood, in his *British Song Birds*, quotes the following communication:—'My correspondent, Mr. H. Barlow, of Cambridge, informs me, that during the remarkably mild winter of 1833, he observed the Whin Chat hopping about near some Furze-brakes in his neighbourhood. The bird was seen on Jan. 15 and Feb. 20, but only on those two occasions, though the Common was visited every clear day in those two months.' Among various notes sent me by the Rev. Robert Holdsworth, of Brixham, is the following:—'In a path near my residence, situated at the entrance of the river Dart, in one of the warmest spots in England, I found a Whin Chat dead during a very severe frost, Jan. 20, 1829. Wind N.E.'"—p. 250.

Mr. Yarrell observes, that though the Nightingale is not included by Mr.

RYLANDS in his "Catalogue of the Birds of Lancashire" (*Naturalist*, Vol. II., p. 349), it has been heard on the north-west side of England as high up as Carlisle, but no further.

Although we could otherwise but ill afford it, and although we must be exceedingly brief, we cannot resist the temptation of recommending each individual part of this work on its first publication.

The India Journal of Medical and Physical Science. Edited by FREDERICK CORBYN, Esquire. Nos. ix—xii. Calcutta: *G. Woollaston*, 49. Cossitollah. 1837.

The India Review; and Journal of Foreign Science and the Arts. Edited by FREDERICK CORBYN, Esq. Nos. xviii—xx. Calcutta: *Woollaston*. 1837.

THE former of these Journals is issued on the 1st of every month, the latter on the 15th. We have already (p. 283) recommended previous numbers to our readers, as occasionally containing notices of interest on Natural History. The works consist chiefly of reviews, original and extracted communications, notices of recent patent inventions, &c. Wood-cuts, and sketchy full-lengths of individuals—the latter mostly of local interest—are given with each number.

LITERARY INTELLIGENCE.

MR. VAN VOORST announces that Professor T. R. JONES, of King's College, has in preparation *A General Outline of the Animal Kingdom*, with 300 engravings, to be published in 15 monthly parts, the first to appear in July. The work is intended to exhibit the structure and internal economy of every class of living beings, and their adaptation to the circumstances in which they are designed to exist.—Mr. T. B. HALL intends to publish in the autumn, by subscription, a *Flora of Liverpool*, with a map. The plan, as set forth in the prospectus, is so excellent, and Mr. HALL's zeal and knowledge as a botanist are so creditable, that we have no doubt of its proving a valuable flora. The Editor of this Journal will be happy to receive the names of such intending subscribers as may not find it convenient to address their letters to the author at Woodside.—The following and other new books and periodicals have been received for review, and will receive early attention :—*The Connexion of Natural and Divine Truth*, by the Rev. Professor POWELL, M.A., F.R.S., &c.; *A Treatise on Insects*, by JAMES WILSON, F.R.S.E., M.W.S.; *A Treatise on Molluscous Animals*, by the Rev. Dr. FLEMING; *A Treatise on Mineralogy*, by Professor JAMESON.

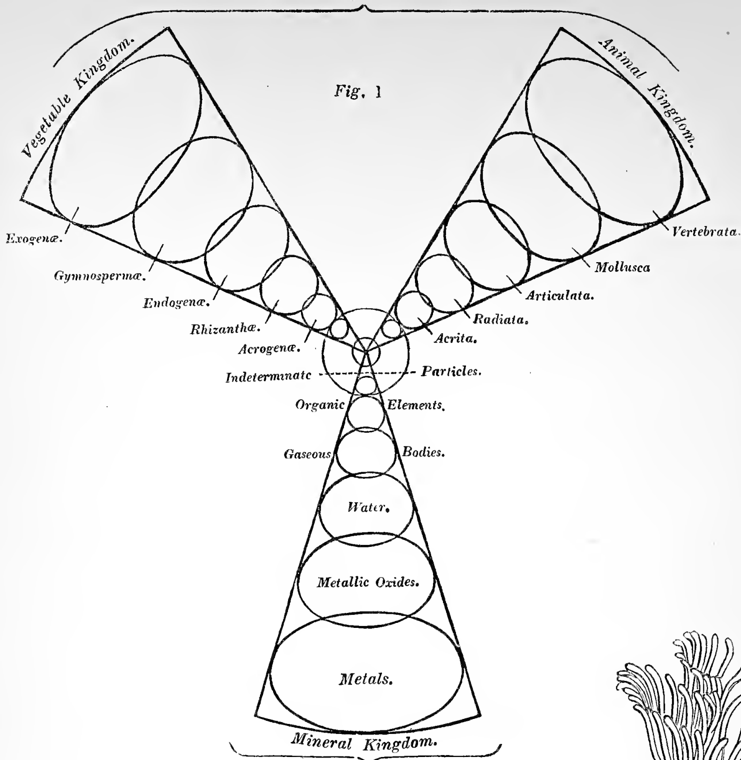
OBITUARY.

We regret to announce the departure from this life of Thomas Andrew Knight, Esq., of Downton Castle, Herefordshire. Our notice of this gentleman is extracted from an article written, as Mr. Loudon justly observes, in an excellent spirit, by Dr. Lindley, and published in *The Athenæum.*

Mr. Knight was born at Wormsley Grange, near Hereford, Oct. 10, 1758, being the youngest son of a clergyman of the Church of England, whose father had amassed a large fortune in the iron trade. He lost his father early, was sent to school at nine years of age, and afterwards entered Baliol College, Oxford. He soon showed great powers of observation and reflection; and acquired his first love of botanical science in the idle days previous to his entrance at Ludlow school. We follow Dr. Lindley in calling them "idle"; though possibly, had his active mind been early vitiated by ordinary scholastic training, it might have been depressed beyond the power of subsequent good management. In 1795 Mr. Knight began to be publicly known as a vegetable physiologist. "The great object which he set before himself, and which he pursued through his long life with undeviating steadiness of purpose, was utility. Mere curious speculations seem to have engaged his attention but little." He accordingly studied to improve, by his indefatigable scientific researches, the various kinds of fruits and vegetables used at table, an object in which his labours have been crowned with perfect success; "and if henceforward the English yeoman can command the garden luxuries that were once confined to the great and wealthy, it is to Mr. Knight, far more than to any other person, that the gratitude of the country is due." In social life he was full of benevolence, and his loss will be severely felt, not only by his family, but by his numerous tenantry and dependents; and he bore with philosophic resignation one of the severest of trials—the loss of an only and much-beloved son. "His political opinions were as free from prejudice as his scientific views; his whole heart was with the Liberal party, of which he was all his life a strenuous supporter.—It is no exaggeration to add, that no living Man now before the world can be said to rank with him in that particular branch of science to which his whole life was devoted."

Mr. Knight's services to various scientific Societies are well known. He contributed to them several valuable papers, and suceeeded his friend Sir Joseph Banks in the presidency of the Horticultural Society.—He died in London, at the house of Mrs. Walpole, one of his daughters, after a short illness, on the 11th of May, 1838, in the 80th year of his age.

ORGANIC MATTER.



INORGANIC MATTER.

Fig. 2.

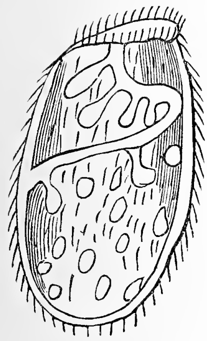


Fig. 3.

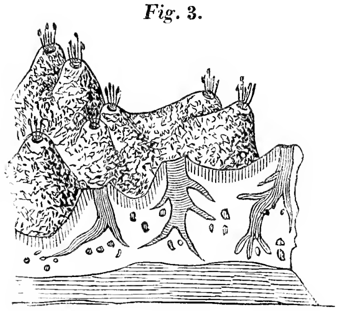


Fig. 4.

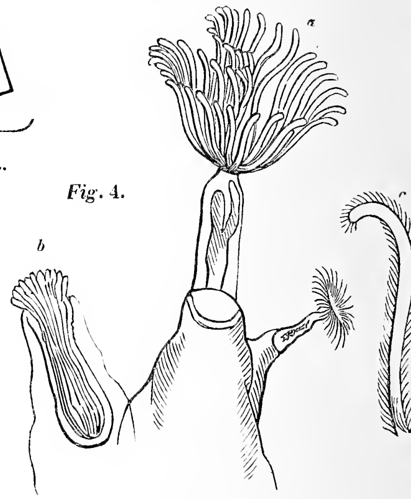


Fig 5.

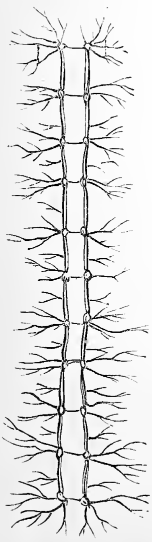


Fig. 6.

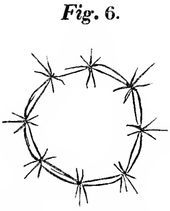


Fig. 7.

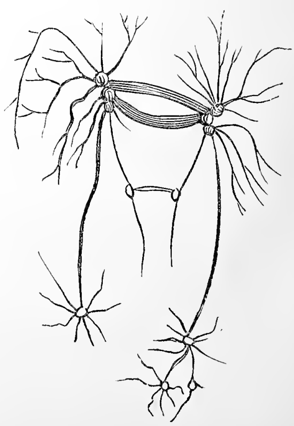


Fig. 1. Tabular view of the disposition of matter throughout Nature.—Fig. 2. *Monas termo*, magnified.—Fig. 3 A sponge, with its oral and fœcal orifices, and tubular structure, exposed.—Fig. 4. Tentacula of *Polypiphera: a*, tentacula unfolded; *b*, the same closed; *c*, a single arm magnified, to show its ciliæ.—Fig. 5. Nervous system of *Talitrus locusta.*—Fig. 6. Nervous system of *Beröe pileus.*—Fig. 7. Nervous system of *Bulla lignaria.*

THE NATURALIST.

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REMARKS ON THE GENERAL STRUCTURE AND HABITS OF INVERTEBRATE ANIMALS.*

By Edwin Lankester, M.R.C.S., &c.

In making the following observations on a department of Natural History, it is perhaps hardly necessary that I should define what is meant by that term; still as it is used in more senses than one, a word or two upon it may not be deemed inappropriate. In its most extended sense, Natural History means the history of Nature; and therefore whatever objects or phenomena present themselves to our minds in the world around us, must be included in it. It is thus a name comprehending all human knowledge. But there is a more limited sense in which it is used popularly, and which will not admit of accurate definition. In fact, in this sense it is applied to any thing generally interesting about animals, plants, and minerals, belonging, speaking correctly, to the sciences of Anatomy, Physiology, Zoology, Botany, and others.

In its most extended meaning, this term is undoubtedly most correctly used, but custom having sanctioned the latter sense, it is that which had better be adopted.

In looking over the catalogue of all our knowledge of external objects, we shall find it may be reduced to two great divisions, the first being the knowledge we possess of objects in Nature as mere existences, and the second the knowledge we possess of things in action, and requiring time for the performance of these actions. The former comprehends the external properties of bodies, as their colour, size, form, shape, &c.; the latter comprehends the changes that may take place in bodies with regard to any of these properties. Now all objects in Nature ought to be observed under these two points of view, and I have mentioned them here, as such a distinction becomes important, for every natural object possessing, first, certain general properties, as form, size, colour, weight, and place; and secondly, being capable of undergoing certain changes in these

* Being the substance of a lecture delivered at the Doncaster Lyceum, April 30, 1838, Mr. Morey, Surgeon, in the chair.

properties, requires to be studied in this manner before we can obtain a correct knowledge of its Nature. These two conditions of an object are constantly considered in Natural History. As an instance, let us take a plant: I may know its colour, size, form, weight, and the place in which it grows, but unless I know the changes which are undergone by the plant with regard to its size, form, weight, colour, and so on, I cannot be said to know its natural history.

Although these remarks will extend to but a small portion of the objects of Natural History, yet a few observations on the relation they bear to other objects in Nature will not be unnecessary.

All objects in Nature are arranged in three great divisions, which may be respectively represented by a mineral, a plant, and an animal; and the collections of objects in Nature bearing the characters of these things are called the mineral, vegetable, and animal kingdoms. Now the basis of every thing in Nature is matter, and the only difference between a stone and a plant is, that the latter form of matter is endowed with properties the former does not possess. Whilst the matter, again, of which an animal is constituted differs from the matter of the plant, in being endowed with properties denied to the plant. The Mineral Kingdom, then, the lowest of these divisions, is universally subject to what are called the laws of matter, or physical laws, but when we ascend to the Vegetable Kingdom we shall find a new property added to matter, which to a great extent controls and modifies the mere physical laws to which minerals are subject; this is the principle of vitality. On ascending higher, and entering the Animal Kingdom, we find other properties added to matter which exercise a controlling influence over the properties it possesses as a mineral or a plant. The laws which minerals obey in common with plants and animals are called physical laws; the laws which the principles of vitality in plants obey, and which they have in common with animals, are called the laws of organic life, or organic laws; whilst the laws which the animal machine obeys, distinguished from the two others, are called the laws of animal life. Each of these departments comprehends an almost countless number of objects, and the attention of scientific men has been directed at all times to the means of distinguishing these from each other. Hence have resulted those systems of classification, the permanence of which being secured by the art of printing, have been gradually improving up to the present day. In this manner upwards of 80,000 plants have been described, so that a botanist can easily distinguish one from another. In the Animal Kingdom, 20,000 species of insects alone have been described as indigenous to Britain. Our knowledge of the objects of Nature is thus every day increasing, and we are furnished with the means of deducing those great principles or laws by which the Deity upholds all things, and by a knowledge of which Man can alone expect to ensure

all that happiness and delight which his existence in this world is calculated to confer.

There are two ways of arranging the objects in these kingdoms in a systematic manner. By one way, particular properties or qualities of objects are made the basis of arranging them into a system. This method is artificial, and although founded on natural properties, yet, taking only single properties into consideration, objects are often brought together which are very dissimilar in their real nature. Such systems are called artificial. The celebrated botanical system of Linnæus is "a good illustration" of this mode of arranging natural objects, exhibiting both its advantages and defects. The other mode of classifying natural objects is by considering all the properties and qualities they may present, and by giving a proper relative value to each, to bring those objects together which most resemble each other in their real nature. These are called natural systems, and are the only ones by which science can be advanced.

In looking at the three kingdoms of Nature, we find that they do not pass into each other by an ascending line, but that there is a central point from which each appears to start, and the further any individual of one kingdom may be removed from this point, the less does it resemble individuals in the other kingdoms. But close to this central point it is very difficult to determine to which kingdom the objects belong. It is at this part of our plan that we must station those minute and, to the naked eye, invisible particles which are constantly moving about in water, and which may or may not be inanimate matter, or the germs of vegetables or animals. It is here we must refer those inscrutable beings called "first plants" and "first animals" (*Protophyta* and *Protozoa*), which have caused so much perplexity to scientific observers, some thinking them all plants, others considering them all animals, whilst some again believe they begin their existence as plants, and finish as animals; and others conceive they commence life as animals, and finish as plants.

Amongst those beings which seem to claim a situation amongst animals on account of their movements is the *Oscillatoria*. There are, however, among the tribe of plants called *Confervæ* many others which exhibit, both in their embryo and perfect state of existence, motions as singular as the *Oscillatoria*. *Ulva bullata* is one of these; and the peculiarly fantastic movements of its germs or ovules are calculated to excite the greatest interest in this obscure part of the dominions of Nature.

In tracing up the line of succession in the Animal Kingdom, it is difficult to know exactly at what point to begin, two or three of the lower groups of animals claiming in some characters a close relation to the Vegetable Kingdom.

However, without entering into the various claims of these groups to be considered the lowest in the animal scale, I shall commence my observations on the Animal

Kingdom by a tribe of beings which have generally been considered as the simplest form of animals.*

If, at this season of the year, we have recourse to any pond, brook, or exposed piece of water, and take but a single drop of their contents, we shall find by the aid of the microscope, though invisible to the naked eye, we have secured a little world full of life and motion teeming with inhabitants, endued with instincts and functions as calculated to afford happiness as those we see possessed by the more complicated tribes of beings that cover the surface of the immense globe we live upon†.

* In the following observations I have adopted in some measure the arrangement of Mr. KIRBY in his *Bridgewater Treatise*, as being the most popular work on the subject; but since this differs considerably from the classifications of recent writers, I have drawn up a list of the classes with their sub-kingdoms, as far as I intend to illustrate them, and given a familiar example of each, according to the views of Dr. GRANT, Professor of Zoology and Comparative Anatomy in the London University:—

Sub-kingdom I.—Radiated or Cyclo-neurose Classes.

	CLASS.	EXAMPLE.
1.	*Polygastrica*	Vinegar Eel, *Monas*, *Volvox*.
2.	*Poriphera*	Common Sponge.
3.	*Polypiphera*	Coral, *Madrepores*.
4.	*Acalepha*	Jelly-fish, Portuguese Man-of-War.
5.	*Echinoderma*	Star-fish, Sea-urchin.

Sub-kingdom II.—Articulated or Diplo-neurose Classes.

6.	*Entozoa*	Tape-worm, Fluke, Hydatid.
7.	*Rotifera*	Wheel-animalcule.
8.	*Cirrhopoda*	Barnacle-shell, Sea-acorn.
9.	*Annelidæ*	Earth-worm, Leech.
10.	*Myriapoda*	Hundred-leg, Millipede.
11.	*Insecta*	Fly, Beetle, Bug.
12.	*Arachnida*	Spider, Scorpion.
13.	*Crustacea*	Crab, Shrimp, Lobster.

Sub-kingdom III.—Molluscous or Cyclo-gangliated Classes.

14.	*Tunicata*	*Pyrosome*.
15.	*Conchifera*	Cockle, Oyster.
16.	*Gasteropoda*	Snail, Whelk, Periwinkle.
17.	*Pteropoda*	*Hyalea*.
18.	*Cephalopoda*	Nautilus, Cuttle-fish.

These sub-kingdoms are founded on the different arrangements of the nervous system in the various classes which they comprehend. In the first the nervous matter is either diffused throughout the whole animal in a molecular form, or in a circular form, as Fig. 6. In the second the nervous matter is arranged in two parallel lines as in Fig. 5. In the third the general arrangement of the nervous system is circular, but its continuity is interrupted by little swellings called ganglions, as in Fig. 7.

† We presume Mr. LANKESTER here intends merely to state that every animal, however low in the scale, is so organised as to possess a certain degree of happiness, and to prevent its being

Amongst the class of animalcules which are called *Infusoria*, on account of their being found so abundantly in vegetable infusions of all kinds, we have many of different shapes and sizes, habits and instincts. I have here a representation of one of the smallest that is seen by ordinary microscopes, called *Monas termo*, and which is not more than the $\frac{1}{10,000}$ of an inch in diameter. They are found to possess in their interior several little bags for the purpose of receiving their food; they are in fact stomachs, and on this account they have received the name of *Polygastrica*. *Monas termo* is figured in the plate, Fig. 2.

The propensities of these little creatures do not at all belie their structure; they are most destructive and voracious beings. Every drop of water they inhabit is a constant scene of confusion and carnage, on account of their ferociously preying on each other. This, however, is not their only food, for they partake abundantly of the vegetable particles that float about in the water with which they are surrounded. A singular point in the economy of these little animals is their power of retaining their vitality; although they die in their natural element in the course of a few weeks, yet if allowed to become dry, they will assume their activity on the addition of water for years after. They are found in all kinds of fluids, imparting life and activity to the pink dew-drop, sparkling in the morning sun, and giving to every drop of the water of the ocean millions of inhabitants.* They are found in almost every fluid taken up by plants and animals as nutriment; and in the fluid portions of plants and animals themselves they exist in abundance.

I have before observed that no-where in Nature do we find an exact ascending scale of organisation, and accordingly, in the classification of the Animal Kingdom, we are frequently obliged, for convenience, to group its objects according to their general properties. Now, then, if by taking the single property of being invisible to the naked eye, I group together all animals possessing that property, I should expect to bring together animals very dissimilarly formed, for the Creator, in the exhibition of his power, does not display to us the most design in the largest forms of created beings, but generally treasures up the most brilliant

miserable: for the proportion of positive happiness must, we conceive, be in direct ratio to the degree of development possessed by each animal. It follows, throughout the kingdom, that the more organs appertain to the species, and the more complete these organs are, the more will the creature enjoy itself, as long as it has the power of employing its organs in the manner intended by Nature. The same law which holds good as regards physical matters, is strikingly illustrated in mental nature. Thus Man excels all the lower animals in the number and quality of his cerebral faculties, and has, therefore, a greater capability for happiness than the brutes. Those men, moreover, who act rationally by the greatest number of faculties, and chiefly by the higher faculties, are, *cæteris paribus*, the happiest.—Ed.

* Ehrenberg calculates that a single drop of water may contain 500,000,000 of some of these *Infusoria*.

proofs of His wisdom in the least attractive objects. It is thus that we find more evidence of the existence of a God in the structure of an animalcule than in the pompous movements of the physical universe.

In this group, then, I have included the Wheel-animalcule (*Rotifera*), in order to show how complicated a structure may exist in an almost invisible particle of organic matter. *Hydatina senta*, common in ponds of fresh-water, possesses a strong masticatory apparatus, supplied with powerful muscles, a long alimentary canal, and a highly developed nervous system.

Perhaps nothing is more astonishing than the varieties of forms presented by these little animals; there is a little Eel-like animal called a Vibrio, which, being introduced into the sap of the stems of Wheat, at last gets into the fruit, and there produces such destruction as renders the grain useless. Hundreds of them are contained in a single grain of Wheat, and they constitute the disease known to farmers by the names of "ear-cockle" or "purples."

Dalyell, the translator of Spallanzani, who devoted many years of his life to the investigation of these animals, sums up their forms and other characters in the following words:—"One is a long slender line; another an Eel or Serpent; some are circular, elliptical, or triangular; one is a thin flat plate; another like a number of reticulated seeds; several have a long tail almost invisible; or their posterior part is terminated by two robust horns; one is like a funnel; another like a bell, or cannot be referred to any object familiar to our senses. Certain animalcules can change their figure at pleasure, sometimes they are extended to immoderate length, then almost contracted to nothing; sometimes they are curved like a Leech, or coiled like a Snake; sometimes they are inflated, at others flaccid; some are opaque, while others are scarcely visible from their extreme transparence. No less singular is the variety of their motions; several swim with the velocity of an arrow, so that the eye can scarcely follow them; others appear to drag their body along with difficulty, and move like the Leech; and others seem to exist in perpetual rest; one will revolve on its centre or the anterior part of its head; others move by undulations, leaps, oscillations, or successive gyrations; in short, there is no kind of animal motion, or other mode of progression, that is not practised by animalcules."

Infusoria have been lately recognised in a fossil state by Ehrenberg, a summary of whose observations appeared in *The Analyst* for October, 1837.

The next group of animals is very different from the last in size, structure, and functions. They are called *Polypiferous* animals, on account of their being supplied with an abundance of peculiar organs called *polypi*. These organs are not only used for the purpose of prehension, but also by their constant movement they serve to agitate the water in which these animals live, and thus bring their food near them. This is quite a necessary arrangement for this class of animals,

or, unlike almost all others, they are unable to move from place to place. The form of their tentacula will be seen in Fig. 4. Every animal body must possess some kind of solid basis or framework, in order to form a support for its softer parts, called its skeleton, and although in some animals this is of a very slight nature, in others we have a remarkably strong and complicated apparatus for this purpose. In this class of animals the skeleton is very simple, being nothing more than a large branched mass of inorganic matter, which either covers its soft parts or supports them, and varies exceedingly in texture, shape, and size, according to the requirements of each particular kind of animal. The skeletons or organs of support of these animals are known as objects of ornament, by the names of Corals, Madrepores, Millepores, &c. The size to which these attain is sometimes very great; each of these masses must not, however, be regarded as the skeleton of a single animal, but rather as the work of a community. Although it is very difficult to say whether we ought to consider each polype as an entire animal, yet on account of the facility with which they are enabled to maintain an independent existence, the collected masses have generally been considered as an aggregate of animals. These animals generally inhabit the depths of the ocean, where the branched forms of their organs of support, and the varied colours and shapes of their tentacula, give them the appearance of a forest of trees. In fact it is not yet a hundred years since naturalists mistook many of these curious animals for plants; and even now they bear a name, zoophytes, which would indicate that they belong both to the animal and vegetable kingdoms. These animals exist in such enormous numbers at the bottom of some seas, that the collections of matter forming their skeletons are often brought almost to the surface of the ocean, where they form formidable reefs that frequently seal the fate of the unwary mariner who navigates his bark upon their unseen summits. But more than this, these reefs are sometimes thrown above the level of the sea by volcanic or other changes, and thus these animals have been supposed to be the chief agents employed by the Creator in forming those delightful islands scattered so abundantly throughout the Southern Sea.

I cannot here enter into any particulars concerning all the varied forms these creatures assume, nor indeed of any of the other classes of animals to which I allude, but there is one form which, as it is so well known, I cannot but refer to. I allude to the Common Sponge. This is not a vegetable production, as often supposed, but is the organ of support or skeleton of an animal belonging to this class. It differs from those I have just mentioned in not possessing tentacula, and may indeed be considered as the simplest form of animal life. In all Sponges we find several pores or holes, the smaller of which are destined for the purpose of receiving the sea-water in which they live, which, being filled with animalcules, the Sponge appropriates them as food; and the water, thus deprived of its

nutritious particles, is driven out by the larger orifices. The large and small orifices, with the tubular passage intervening, are represented at Fig. 3.—The discovery of this singular fact—which entitles these objects to be considered as animals—is due to Dr. Grant, in whose beautiful language I cannot do better than give you an account of the discovery :—" I put," says he, " a small branch of the *Spongia coalita* with some sea-water into a watch-glass, under the microscope, and on reflecting the light of a candle through the fluid, I soon perceived that there was some intestine motion in the opaque particles floating through the water. On moving the watch-glass, so as to bring one of the apertures on the side of the Sponge fully into view, I beheld, for the first time, the splendid spectacle of this living fountain, vomiting forth, from a circular cavity, an impetuous torrent of liquid matter, and hurling along in rapid succession opaque masses, which it strewed every where around. The beauty and novelty of such a scene in the animal kingdom, long arrested my attention, but after twenty-five minutes of constant observation, I was obliged to withdraw my eye, from fatigue, without having seen the torrent for one instant change its direction, or diminish, in the slightest degree, the rapidity of its course. I continued to watch the same orifice at short intervals for five hours, sometimes observing it for a quarter of an hour at a time, but still the stream rolled on with a constant and equal velocity."

The Sponges assume a variety of forms and shapes, some of them very singular and beautiful. They are, however, best known to us in the form of Common Sponge.

The next group of animals on which I shall remark are called *Radiata*, on account of the manner in which their parts are arranged. This section of the Animal Kingdom is divided into two parts, the Gelatinous Radiaries and the Spiny-skinned Radiaries. Of the former the Jelly-fish is an instance, of the latter the Star-fish. Amongst the Jelly-fish we find a little lucid creature. This animal is very abundant in the ocean, and literally crowds it in some places; they are, however, so lucid as to be seen during the day; but in tropical climates they are phosphorescent, and it is when the light of the day is retiring that these creatures frequently present a brilliant spectacle to the delighted eye of the traveller of the ocean. First one is seen and then another, then hundreds, and thousands and tens of thousands, till the whole ocean is covered with an uninterrupted blaze of phosphorescent light.

The Common Jelly-fish or Sea-nettle (*Medusa*) is another form of this class of animals, and must be well known to those who have been in the habit of sailing or rowing on our seas and estuaries. The elegant contractions and expansions of its lucid body, as it gracefully moves along the waters, excite alike our curiosity and admiration.

Some other forms of these gelatinous animals are worthy attention, on account of their beautiful colour, and the circumstance of their being capable of elevating themselves to the surface of the ocean, and riding proudly over its heaving billows. One species of this kind is called the Portuguese Man-of-War (*Rhizostoma*).

The divisions of these animals represented by the Star-fish are composed of a skeleton constituted of several hundred separate pieces, and covered over with a thick coriaceous skin, on which are placed a number of tubercles, the tubercles being surmounted by spines. The pieces or plates of which the skeleton is composed are beautifully fitted into each other, although not all of the same size, and are arranged so as easily to allow of the growth of these parts. Dr. Grant has calculated that in the edible *Echinus* there are not less than ten thousand separate pieces composing its skeleton.

The principal forms of these animals are very well represented by the common Star-fish, the Sea-urchin, and the Sea-anemone, or *Actinia*. The mode of progression amongst these animals is effected by means of suckers, with which they are abundantly supplied; on applying these organs to any object, they have the power of exhausting the air from within them, and they are thus fixed to a particular spot by the pressure of the atmosphere and water from without. It is also by means of these instruments that they lay hold of their prey, which seldom escapes them, if once they touch it with only one of these suckers. These animals—contrary to what we see generally in the Animal Kingdom—prey upon beings higher in the scale of organisation than themselves; they attack small Crabs, Lobsters, and even fish; and to enable them to consume such food some of them are supplied with a remarkably complicated apparatus of mastication, as in the *Echini*.

The Sea-anemonies are perhaps the most interesting of these animals, on account of their shape and colour resembling the beautiful forms of the flowers of plants. They are generally attached to rocks at the bottom of the sea, and whilst expanded they assume the appearance of a richly-variegated bed of flowers, which would vie with the gayest and brightest ornaments of the parterre.

With these animals one of the larger sub-divisions of the Animal Kingdom ends; they are called Radiated or Cycloneurose Classes. The next sub-division I shall refer to is that of the Molluscous or Cyclo-gangliated Classes. These are familiarly known on account of the greater proportion of the animals possessing an external skeleton, the study of the forms of which has given rise to the interesting science of Conchology.

The first among these animals is a little group called Tunicaries, and they seem to form a transition from the aggregated animals we have been considering, to those which are provided with external shells.

These tunicated animals are more perfect in their organisation than any

hitherto considered, possessing a mouth, stomach, heart, and other organs in a high state of development. We have here two kinds of animals; the one may be represented by the *Pyrosome*, which is an aggregated floating animal, whilst the other will be represented by the *Cynthia*, a single animal, and fixed for life to the same spot. The *Pyrosome* has a large tubular base, upon which are fixed hundreds of little animals. This tubular base varies in size from three to twelve inches, and it is by the passage of the sea-water through its hollow interior, as it passes to supply the animals with air and food, that it is kept in constant motion. This animal has also the property of phosphorescence, and is one of the most brilliant of the numerous tribes of lower animals that gild the ocean with their sub-marine fires. The single form of these animals is not uncommon on our own coasts, where they are known from the singular fact that when caught by fishermen they squirt from their bodies a large quantity of water in the face and eyes of their luckless captor, so as often to prevent him securing his prey. These being single, and having a thick fibrous covering over them, lead us by an easy transition to the next group of animals, which are the Shell-fish; animals in general living in shells and called Molluscous.

These animals are divided into three kinds; those with a single shell called Univalve, those with two shells called Bivalve, and those with more than two shells Multivalve.* These may be respectively represented by a Snail, an Oyster, and a Barnacle. To begin, then, with the Univalves, of which the Snail is the type. All the classes previously examined are inhabitants of the water, but a small proportion of those we have entered on live upon the land. The most common of these are the various kinds of Snails (*Helix*), but there are several kinds which assume a variety of interesting forms.

Many of them inhabit the ditches and fresh-water ponds in the interior of the country; they are very numerous in many districts, and as their forms are easily studied, and their collection is not difficult, they form a good subject for the initiatory studies of a young naturalist.

The most attractive and curious part of the Mollusca is certainly their shell, and in this organ we have a beautiful exemplification of the way in which creation gradually passes from a simple to a more complicated form. Now belonging to this class is the Common Slug, which, though often looked upon as an object of disgust, is endowed with a structure, functions, and instincts as elevated as the princely inhabitants of those gorgeous shells that so often ornament the halls and rooms of our dwellings. The Common Slug has no shell, but

* I have used this division as the most convenient, although, anatomically, the Multivalves differ greatly from the two former, and are placed amongst the articulated classes in scientific arrangements.

many persons when walking along the roads, on a fine summer's evening, after the fall of a refreshing shower of rain, will have observed, amongst the numerous species of Snails and Slugs that then appear slowly gliding over the moist foliage, a very large Slug (*Limosella*), variegated like Tortoise-shell. In the back of this Slug there is a shell, a very simple one, but it may be looked upon as the commencing or vanishing point of shells amongst these animals. If we now go to some lake or pond, and pluck a leaf of the Water-lily, it is a great chance but we find upon it the fresh-water Limpet (*Patella*). This animal will supply us with a shell almost flat, but still a little concave. In some other forms of Limpets we shall find the shell more concave, and presenting the form of a cone with a very enlarged base. From this we may trace shells which gradually present more acute cones, as in the Bonnet and Chambered Limpets (*Patella nereitoidea* and *P. Chinensis*). A curve now begins to take place, and is well seen in the Tooth-shell (*Dentalium*). In some of the Worm-shells (*Serpulæ*) we have the commencement of the spire. The spire may be next seen in a simple form in the Sea-ear (*Haliotis*). It becomes more developed in the Nereides (*Nereidæ*). In the Snails and Periwinkles it is still more developed, and when we have arrived at these forms we may yet trace its complication through the Common Whelks (*Buccinum*) to the elegant forms of the Dippers (*Bullæ*) and Cowries (*Cypræa*).

The shells of the Univalve Mollusca are many of them very highly prized; there is one in a museum at Paris belonging to the Cone tribe, which is not more than two inches long, and has been valued at three hundred guineas; many others exist, valued at from twenty to two hundred guineas. In some parts of the world they are employed as a medium of circulation, instead of coin. The Cowries are mostly used for this purpose. But many of them serve for more useful purposes. In France a large species of Snail (*Helix pomatia*) forms a delicious article of diet; whilst the Periwinkle and the Whelk are esteemed in our own country.

The Bivalves, of which we have many familiar examples, as in the Oyster, the Cockle, the Muscle, &c., may be divided into two sections; first, those which bore or live in rocks, wood, mud, &c., and those which live free in water, and are enabled to walk about by the aid of a foot, which projects from between their shells.

Among those which bore we find the Ship-worm (*Teredo navalis*). These animals are supplied with two little shells, which, acting like rasps, enable it to penetrate wood. They attack wood wherever it is found in the ocean, and seem to occupy it more as a resting place than for any other purpose.

Another kind of these Bivalves attack even a harder material than wood, and

are found introducing themselves into the substance of the hardest rocks, and are called Rock-borers (*Pholades*).

Of the other borers the Stone-eater, the Common Cockle, and the Razor-shell (*Solen*) are examples. The Common Cockle buries itself in the sand, and is always found in this position on the margins of our rivers, waiting for the return of the tide, when it opens its shell for the purpose of admitting the water, which is charged with matters necessary to its subsistence.

Amongst the Bivalve shells that creep about with the aid of a foot is the Clamp-shell, which is sometimes four or five feet long, and weighs as much as 400lbs. From its weight some idea may be formed of the powerful nature of the muscular power by which this animal perambulates the mountains and vallies at the bottom of the sea.

The best-known and most useful of this group of animals is the Oyster; and it is the only one that is cultivated by Man. They are found at the bottoms of the ocean and rivers. When cultivated they are placed in what are called "beds" in rivers, where the salt-water has access only during the flow of the tide.

But of all shell-fish that which perhaps has excited greatest attention is the one that produces pearls. This is a kind of Muscle (*Mytilus margaratiferus*), and the pearl is produced on the inside of its shell. The pearls are not a natural but a diseased production, so to speak, for it is only after the shell of the Muscle has been pierced by some external intruder, or when it has been irritated by some annoying substance, that this costly jewel is produced. Sometimes some of the boring animals of the preceding section are the cause of this; in attempting to penetrate the shell of the Pearl Muscle, that animal has the power of secreting from its mantle this peculiar, hard and precious substance,* which thus excludes the entrance of the borer, and saves the Muscle from destruction. Off the coasts of Ceylon, the Persian Gulf, and the Sea of New Holland, this animal is found in abundance. At Condatchy, in Ceylon, is the largest fishery, where, for thirty days in the year, not less than 6,000 boatmen and attendants are engaged in the business.

On looking at these shells we should hardly suppose that they were intended to swim, much less to sail; yet many of them have the power of elevating themselves to the surface of the ocean, and there opening themselves; one of their shells serves for a boat, and the other is hoisted for a sail, and thus they glide merrily over the waves of the sunny ocean.—This is said to be the case with the Cockle and the Venus-shell.

Most persons who know the Common Oyster will probably have observed on

* On the question of the manner in which Pearl is formed, in reply to Mr. LANKESTER's remarks, see Mr. LEVISON's letter in *The Naturalist*, Vol. III., p. 378.—ED.

the outside of their shells some little white acorn-shaped bodies, looking something like young Oysters; but they are not young Oysters; they are, however, animals belonging to the third section of the Molluscous class, and are called Sea-acorns (*Balanus*). These, then, may be taken as the representatives of the Multivalve Mollusca. This tribe is not very large, but it is interesting as containing the Barnacle, a curious shell-fish, about which some singular opinions have been entertained. If one of these animals be examined, there will be found projecting from the shells a number of long slender organs called arms, which are clothed with hairs or ciliæ, so as to give them the appearance of feathers. Now these organs—whose real use is to produce currents of water to enable the animal to seize its prey—were at one time supposed to be the feathers of a young Goose, which in due time would become fitted for a very different state of existence. This wonder was perfectly believed by men of science a few centuries back. The following is the account given of this "woonder of England," as it was called, by GERARDE in his *Historie of Plants*:—"Having travelled," says he, "from the Grasses growing in the bottome of the fenny waters, the woods, and mountaines, even unto Libanus itself: and also the sea and the bowels of the same, we are arrived at the end of our historie, thinking it not impertinent to the conclusion, to end with one of the marvels of this land (we may say of the world); the historie whereof, to set forth according to the woorthiness and rarity thereof, would not only require a large and peculiar volume, but also a deeper search into the bowels of Nature than my intended purpose will suffer me to wade into, my insufficiencie also considered; leaving the historie thereof rough hewen unto some excellent men, learned in the secrets of Nature, to be both fined and refined. In the meane space take it as it falleth out, the naked and bare truth, though unpolished. There are found in the north parts of Scotland, and the islands adjacent, called Orchades, certain trees whereon do grow certain shell-fishes, of a white colour, tending to russet, wherein are contained little living creatures; which shells in time of maturitie doe open, and out of them grow those little living things, which falling into the water doe become fowles whom we call Barnakles, in the north of England Brant Geese, and in Lancashire Tree Geese; but the others that do fall upon the land perish, and come to nothing. Thus much from the writings of others, and also from the mouths of people of those parts, which may very well accord with truth." "But what our eies have seen and hands have touched we shall declare." Our author then goes on to describe, in all the minuteness of detail, the various stages of this strange transformation from the time of the shell first opening to the period of the young bird dropping into the sea, "where," he says, "it gathereth feathers and groweth to a fowle bigger than a Mallard and lesser than a Goose."

The last group of animals in the Molluscous division is that which contains

the Pearly Nautilus. Every body has heard of this wonderful sailor, who steers about upon the ocean with all the skill of an accomplished mariner. The shell which contains this animal is very large, and is divided into several compartments, in the external of which only does the animal live. The animal which inhabits this shell is a very curious-looking one, and resembles in some measure one of its congeners, the well-known Cuttle-fish. On account of their organs of progression being fixed in their heads, they are called *Cephalopods.* These, then, are the organs which the Nautilus uses when sailing along upon the wide and open sea. Two of its long legs it stretches in the air for a sail, whilst the others are occasionally used as oars.

I have here some fossils which are very abundant in the strata of Yorkshire, called Ammonites; they look like Snakes curled up, with their heads cut off; and there is a tradition at Whitby, where these fossils are very abundant in the sea, that formerly that town was overrun with Serpents, and that some good Catholic, whose sanctity permitted him to perform miracles, in one day cut off all their heads and drove them into the sea, where they became petrified. Be this as it may, they are found at other places besides Whitby, and some of them are enormously large, being as much as six feet in diameter. Now when one of these is cut across, we find that it presents the same appearance as the shell of the Pearly Nautilus, divided into several compartments; and there is no doubt that these fossilised bodies were once the abodes of animals similarly constituted; and were probably the only mariners that navigated those seas, which geologists tell us existed, not days but ages, before Man inhabited the earth.

(To be continued.)

NOTES ON AN ORNITHOLOGICAL TOUR IN ICELAND IN THE SUMMER OF 1837.

By W. Proctor,
Subcurator of the Durham University Museum.

On my return home, a few days ago, I found your letter, and am sorry that I had not an opportunity of giving it earlier attention. With great pleasure I send you some observations I made on the birds in Iceland last summer. I will transmit them as I made them at the time, and you can correct them as you think proper, if worthy inserting in your valuable Journal.

How beautifully are the works of Nature carried on in those remote regions! It would strike every beholder with surprise to see the different species all breed-

ing and rearing their offspring, and to observe the instinct that is displayed amongst them; but in none more than in the Sclavonian Grebe(*Podiceps cornutus*), which, in the rearing and preservation of its young, displays an instinct truly wonderful. This bird frequents the fresh-waters, and breeds amidst the Reeds and other rank herbage. The nest is large, and floats on the surface of the water, with which it rises and falls. It is composed of a mass of Reeds and other dry aquatic plants. The eggs vary in number from two to four, and are when just laid of a bluish-white colour; but they soon become stained by the materials of which the nest is composed. The size of the egg is one inch three-quarters long and three inches three-quarters round, being a little larger than that of a Pigeon. The young birds, when first hatched, are covered with grey-coloured down. No sooner does the old bird perceive danger from any intruder, than she instantly dives, and emerges at thirty or forty yards distance. One day during my sojourn in Iceland, having observed one of these birds dive from its nest, I placed myself, with my gun at my shoulder, waiting its re-appearance. As soon as it emerged I fired and killed it, and was surprised to see two young ones—which, it seems, had been concealed beneath the wings of the parent bird*—drop upon the water. I afterwards shot several other birds of this species, all of which dived with their young under their wings. The young were placed with their heads towards the tail, and their bills resting on the back of the parent bird.

The Red-necked Phalarope or Lobefoot (*Tringa hyperborea*, Linn.) breeds on little hillocks among the marshes. The nest is composed of a few stems of dried Grass. The eggs are four in number, of an oil-green colour, thickly spotted with black; in dimensions one inch and an eighth long, and two inches three-quarters round, or about the size of that of a Common Thrush. The young birds leave the nest as soon as hatched. On the approach of danger the old bird runs among the aquatic herbage, spreading her wings, and counterfeiting lameness—for the purpose of deluding the intruder, and after leading the enemy from her young, she takes wing and flies to a great height, at the same time displaying a peculiar action of the wings; then descending with great velocity, and making simultaneously a noise with her wings. On her return to her young she uses a particular cry, for the purpose of gathering the young together. As soon as she has collected them, she covers them with her wings like the Domestic Hen.

I visited Grimsey, a small island, which lies about forty miles from the main

* Occasionally when a brood of newly-hatched aquatic birds enters the water for the first time, one or two of the little creatures will contrive to climb on the mother's back, or under her wings. The latter feat, especially, is easily performed by cygnets, on account of the well-known habit of the Swan of sailing with its ample wings half-open, and arch shaped. In the case of the Horned Grebe, however, the concealment undoubtedly took place with the cognizance of the parent, if not with her assistance.—Ed.

land, on the north side of Iceland, for the purpose of collecting the egg of the Little Auk (*Alca alle*, LINN.). This bird makes no nest, but deposits its solitary egg among the large stones above high water mark; and not on the ledges of precipitous rocks, as has been stated. Rocks of that description were observed at the same place, but they were not occupied by a single bird. The female suffered me to remove the stones, and take it off its single egg; this is of a bluish-white colour, two inches long and four inches and a quarter round, or about the size of that of the Common Teal.

Durham, May 21, 1838.

[MR. PROCTOR visited the interesting island which forms the basis of the preceding observations, not so much for the purpose of gaining intelligence respecting the habits of birds, as with a view of obtaining the skins of rare specimens, and eggs, for the Museum of which he is Curator. He has, however, at our request, kindly communicated some notes on the habits of a few British species noticed by him on his tour in Iceland.—We could wish that this island were explored by a competent naturalist, with a special view to recording a general summary of its Natural History; and should be happy to make *The Naturalist* the medium of such a memoir.—ED.]

NOTICE OF RARE BIRDS OBTAINED DURING THE WINTER OF 1837-8.

BY EDWARD BLYTH,
Curator of the Ornithological Society.

CONSIDERING the severity of the past season, and the unusual continuance of the frost in January and February, but few rare birds found their way to the London Market. I purpose to enumerate those which have fallen under my observation, with some others of which I have received intelligence from my friends; and may premise that I believe I know of very nearly all that have occurred at the poulterers' stalls in the metropolis. A few comments on some of the species also, I trust, will not prove unacceptable.

During the very cold weather, several species of ordinary occurrence disappeared altogether, while others, generally less common, were brought in great abundance. Among the former may be instanced the Bernacle and White-fronted Geese, and the Pintail Duck; among the latter, the Bean and Brent Geese, which were exposed for sale literally by thousands, adult Mergansers of the three common

European species, and Hooper Swans. I observed no other *Anatidæ* whose numbers were materially affected.

Mr. Hoy informs me that a beautiful male Hooded Merganser (*Mergus cucullatus*), in thoroughly mature plumage, has been secured in the county of Norfolk; being the first known instance of this bird occurring in its adult garb in Britain. It is indeed remarkable that very nearly all the Mergansers, of each species, were old birds in their final livery; the younger individuals having been driven further southward. This was especially remarkable in the instance of the female Smew, adult specimens of which are of rare occurrence in collections; those obtained in ordinary seasons being almost without exception the young of the year, of which the plumage is exactly similar to that of the young male: in the mature females the sides of the face are black, as in the male, and the markings of the wings much purer and better contrasted; many such specimens appeared in the markets during the severe weather, and when the frost broke up, and the communication with the low countries was renewed, I saw a heap of Swans, from Holland, containing many females, all of which exhibited this handsome state of plumage.

The adult male of the Smew Merganser may be procured, every winter, more or less plentifully in the London markets; and the reason that only the young of the other sex is commonly obtained, becomes obvious on consideration. A bird very like the female Smew is the same sex of the Common Garrot (*Clangula vulgaris*); and the London reader may repair to St. James's Park, and observe how very conspicuous is the brilliantly white plumage of the male Smew at a considerable distance, in comparison with the dark sober livery of the female Garrot. Now birds, as they advance in age, are taught by increasing experience to become more wary; and accordingly the mature Smews, more vigilant than the young, do not generally suffer an approach near enough to render the female readily discoverable; besides which, if the gunner should succeed in stealing within shot, the adult birds being commonly in pairs, the beautiful male is sure to attract his attention, to the exclusion of its mate. To judge, however, from the broken necks* of some of those which are brought to market, it would appear that this species is occasionally taken in the decoys; but here, again, the majority of the birds so taken are the young of the year.

It should be remarked, that the livery in which both sexes of the different Mergansers appear during their first winter, is not that which immediately succeeds the down; for I have obtained specimens early in the season, incompletely moulted, in which a few of their first feathers were consequently observable, indicating that the tertiaries at least, if not all the upper parts, had

* This would be a sufficient proof of their being decoyed birds, if there are no marks of shot in the body.—Ed.

been mottled, each feather having a large terminal pale spot. A curious particular in which the Smew differs from the others, consists in the presence of only one small CŒCUM to the intestine, instead of two, proportionally much larger: this character I have found to be constant in nearly a dozen specimens. The Bay-breasted Merganser (*M. serrator*) is less frequently brought to market than the large species, indeed in the proportion of one to six or seven; but, as already stated, all three were plentiful during the severe weather of last winter. It is worth knowing, that the rich fulvous tint on the breasts of the two large Mergansers may be preserved, in all its beauty, by very carefully secluding the specimens from light for a period of two or three months, after which it is much less liable to fade from exposure; we rarely see a stuffed specimen which retains much of this depth of colouring.

Wild Swans, of the Hooper species, have occurred in most parts of the country in very considerable numbers; and they have been cruelly and wantonly persecuted. On their first arrival, they scarcely manifested distrust, but were at length rendered as timid as they had been fearless; though not till their numbers had been much reduced by insatiate butchering. In one place, on the Thames, I have information of a flock settling among a number of tame Swans,* and readily coming to feed on bread, &c., that was thrown to them; it was consequently hoped that they would have been induced to remain in the locality; but at the breaking up of the frost they all disappeared, after a sojourn of some weeks. At Manningtree, in Essex, however, a number appear to have taken up their abode, and it is expected will breed there.

It is remarkable that no Bewick's Swans occurred at the time of the long frost. Among the multitudes of wild Swans that were seen almost everywhere, and particularly in the eastern counties of England, this smaller species has been much sought for in vain; the endeavour to obtain it has indeed caused the destruction of very many Hoopers. A single young specimen appeared in one of the markets early in the season, and one young bird, and several adults, towards the close; one specimen only was obtained the preceding winter, and this also very late in the season; so that Bewick's Swan, I think, may be inferred to be a bird of passage, generally, rather than a winter sojourner, in the British Islands.† All the examples of it adverted to, passed into the hands of

* Several wild Swans used to visit two tame individuals kept on the lake in Campsall Park, in the night-time. During the day we have seen several flocks pass over the same lake in majestic flight. Numbers of these birds have been indiscriminately shot wherever they could be met with; and we understand that during the stay of the Swans with us, more specimens of the Hooper Swan than of any other bird were sent to the various birdstuffers in the West-Riding of Yorkshire to be preserved.—ED.

† In the winter, I think, of 1832-3, or perhaps the following winter, I saw a very considerable

my friend Mr. Bartlett, of Museum-Street, to whom I am much indebted for allowing me to examine them. I dissected most of them, and arrived at the result that there is no external difference whatever by which the sexes may be constantly distinguised; old females having every character of the male. It is remarkable that several years must elapse before the trachea elongates, forming the horizontal loop backward; for only one specimen (a female) out of six purely white birds exhibited this structure. In general, the sternal apparatus, with the trachea and its accessories, is chiefly distinguishable from that of the Hooper Swan by its smaller size, and the very different form of the bronchi.

The number of tail feathers I have found in both species to be singularly variable, and not unfrequently uneven, while the closest internal scrutiny has failed to detect that any were accidentally deficient. In the Hooper the numbers are 20, 21, and 22; and in the Bewick's Swans 18, 19, and 20.

At the time of the first appearance of these birds the young were wholly grey, but as the winter advanced a few white feathers made their appearance, chiefly among the scapularies; the tendency to moult, however, appeared to be checked, probably from want of sufficient nourishment, rather than in consequence of reduced temperature; for I can hardly conceive that birds so well protected by a close covering of exquisite down as the different Trumpeting Swans are,* can be much affected by cold. An immature Hooper, which was added to the collection of living water-fowl in St. James's Park, has only lately recommenced the renewal of its feathers, but is now moulting rapidly; at the time it was captured, late in January, there was not the slightest sign of yellow upon its bill; a trace of this hue became noticeable about the beginning of April, and at present (May 8) all the basal portion has become conspicuously yellow, though not so bright as in the old birds in winter. In the summer this portion becomes of a very brilliant gamboge-yellow in the adults; there is little doubt but that this young bird, of the preceding season, will become undistinguishable from older specimens by about midsummer.

My friend Mr. Hoy assures me, that a very large male Hooper that was brought to him alive, had a distinct and conspicuous black band crossing the yellow near the base of the bill; a trace of which he has remarked in one other specimen. This character must be of extremely rare occurrence.

Respecting the rufous tinge which is sometimes visible on all the white Swans, I may remark, that this is no sure indication of youth, as generally considered. It is more prevalent, perhaps, though still not universal, in young birds, but it is

number of Bewick's Swans at a stall in Newgate Market; probably there were not less than thirty, all of this species.

* The down of a Hooper Swan is worth about four times that upon an individual of the Mute species, which it far exceeds in quantity as well as quality.

also sometimes observable in old specimens. A Hooper on the lake in the Regent's Park, where it has lived for at least six years, has the crown more deeply rust-coloured than in any other that I have yet seen; and a friend informs me that one of the common domestic species, in his possession, which also is, at the least, six years old, is very deeply tinged with rust-colour all over. A male Polish Swan, also, in St. James's Park (which was purchased as the parent of the female, with which it appears likely to breed this season, and therefore cannot be much under that age, as Swans do not reproduce before they are two years old), is tinged on the head and neck with rust-colour. I could cite additional instances if necessary.

The Polish Swan (*Cygnus immutabilis*) is an accession made this winter to the British fauna; and considering the numbers which have been killed along the range of the eastern counties, from Aberdeenshire to Kent, I have been surprised that none have been sent to the London market. Mr. LEADBEATER had several sent to him for stuffing, and one, out of four that had been shot from a flock near Maidstone, was lent by him to Mr. YARRELL, for the purpose of exhibition before the Zoological Society, when the species was characterized. This bird scarcely differs from the ordinary Mute species, all the characters of which it presents in an inferior degree of development; but it is smaller, and pure white at all ages, even in its first downy covering. As a distinct race, it has long been recognized by several of the dealers, who have designated it—I know not for what reason—the *Polish* Swan. The Ornithological Society purchased an adult pair, with a young one, of which the old female soon died, early in last year. At first, I am told, all three were equally remarkable for the very pale colour, almost whiteness, of the legs and feet, by which only they were obviously distinguishable from the common tame Swan; but at present, although this pallid hue still continues to distinguish conspicuously the young female, the male has the feet as dark as any specimen of *C. olor*. Assuredly, however, the common tame Swan has dark-coloured feet at every age and season.

It is probable that the opinions of naturalists will continue to be divided respecting the validity of *C. immutabilis* to be considered a species. In its anatomy it does not differ from *C. olor;* but I should not on this account infer their specifical identity—that is, their descent from the same aboriginal parentage—as many obviously distinct species, wherever the arbitrary line of demarcation may be drawn, resemble each other so closely that it becomes impossible to assign the limits of approximation; and we do not know why there should, of necessity, be any difference whatever between the most nearly-allied of all, though aboriginally separate, races. At any rate, the occurrence of *C. immutabilis* in large flocks, in a true state of Nature, would seem to point it out as a genuine species; and let it be remembered, that so close a similitude exists in

the peculiar sterno-tracheal conformation of *C. Bewickii* and *C. Americanus*, that on this ground alone, until the external characters of these two species were compared, they were confidently assumed to be identical—and this notwithstanding the analogy afforded by the admitted separateness, and corresponding distribution, of *C. buccinator* and *C. musicus.* This instance is very valuable, as administering a due amount of caution to those engaged in the endeavour to identify fossil remains; as it conclusively proves that absolute similarity does not, in every case, constitute specific identity.

Another addition to the catalogue of British-killed birds will probably be soon made public by Mr. Hoy, who obtained two Geese in Norfolk, from a flock of seven, it would appear of an undescribed species. Two shot Canada Geese were brought, which possibly may have been wild birds from America; but it is not unlikely that they were partially domesticated, and perhaps bred in this country.*

The American Wigeon is a novelty which was obtained by Mr. Bartlett. He selected it from a row of Common Wigeons, deeming it, at the time, to be only an accidental variety of the species; there was a female along with it, which, after some hesitation, he unfortunately left, considering it also as a variety, but insufficiently diverse to be worth preserving; he has since, however, positively recognised the female of the American Wigeon to be identical with the bird he thus passed over, hesitatingly, in the market. The dimensions of the male were 19 inches in length, and 32½ inches in extent of wing; Wilson's admeasurement of the species being palpably erroneous, as will appear on comparison with those which he has given of the Mallard. The beak is rather narrower than in its European relative, and nearly a quarter of an inch longer; the tracheal labyrinth, or rather osseous vesicle, considerably smaller; scarcely exceeding in magnitude that of a Teal. The specimen now enriches the collection of E. Maude, Esq., of the Temple.

While penning the preceding paragraph, my indefatigable friend, Mr. Bartlett, has opportunely called upon me, to shew me a magnificent fresh-killed specimen of the Squacco Heron, which he has just purchased; it is said to have been sent up from Suffolk, and its appearance plainly shews that it cannot have been dead above a day. From the point of the beak to the extremity of the tail it measures 21 inches, and 32¼ inches in extent of wing. Bill livid at base, darker towards

* The Canada Goose, we know, from personal observation, exists in considerable flocks in many parts of England, but invariably in a semi-domesticated state. We have repeatedly found its nest close to the lake at Foston Hall, Derbyshire; and noticed it sailing about with its brood. It is, moreover, little likely that foreign individuals should visit Britain. The Canada Goose is an extremely ornamental bird in a park, and its singular habits must have attracted the notice of every one at all familiar with the species in its natural state.—Ed.

the ridge of the upper mandible; the distal half blackish, abruptly defined. Cere and space around the eyes pale greenish yellow. Iris very pale yellow, almost yellowish-white. The legs and feet pale flesh-colour, with a tinge of yellow, the joints of the toes darker above; the tarsal joints, and especially beneath the toes, more distinctly yellow. The plumage is thoroughly mature, and most exquisitely delicate and beautiful; crest of considerable length; though perhaps not quite so long as in some stuffed specimens which I have seen, still it is longer than usual, even among the adults.*

I have information of a specimen of the Great Auk *(Alca impennis)* having been obtained last winter in Wexford Bay. Being in hyemal aspect, its cheeks, throat, and fore-neck are consequently white. It now adorns the collection of Dr. Birkett, of Waterford.

The same gentleman has also an Irish specimen, it would appear, of *Surnia funerea*. At least my informant so described the bird that I have little doubt of its being this species, and upon my shewing him Gould's plates of the European Owls, he immediately fixed upon it, and again, when I exhibited to him a skin. He was evidently too well acquainted with all the common species to have mistaken one of these.

Mr. Bartlett lately obtained a recent specimen of the Parrot Crossbill. Its length was $7\frac{5}{8}$ inches; extent 12 inches. Mr. Yarrell will figure the sternum of this bird, together with that of the Common Crossbill, which latter has been tolerably plentiful in the eastern counties of England, and also in the north of Ireland, during the past winter. The Parrot Crossbill adverted to was sent from Holland.

Another interesting continental bird recently purchased by the same industrious collector, is that beautiful little *bantam* of a Grouse, *Tetrao bonasia*. Two specimens of it were obtained, both of which had their crops and stomachs filled with Birch-catkins; hence (from the supposition that they feed on Hazel-catkins) has probably originated the name of *Hazel* Grouse, by which it is known to the poulterers. It rarely appears in the market, where it commands a rather high price, being esteemed a particular delicacy; its flesh is remarkably white, contrasting in this respect with all its European relatives.

* Since writing the above, I have examined this beautiful bird more minutely, when it appeared that the feathers of the crest were new, and not full-grown. It had only just acquired its final livery, and had still a few intermixed old feathers, characteristic of the second state of plumage. Its anatomy presented all the usual characters of the Herons; it proved on dissection to be a male, and its stomach contained two small Newts and various water insects. At the divarication of the bronchi were placed two fatty glandular vesicles, the size of a small pea, which possibly may be a seasonal development. All the Herons agree precisely with the Bittern in the conformation of the tracheal apparatus.

An exotic species which is brought very abundantly to the London market, is the Willow Ptarmigan (*Lagopus saliceti*), a larger and stouter bird than the White Ptarmigan of Britain, for which it is often substituted, undesignedly, in collections. In their summer plumage, these two species are very readily distinguished; and in winter, also, the great majority of specimens may be told, at the first glance, by a practised eye; but a few occasionally occur (I am told) of intermediate character, which are not so easy to identify. In all that I have seen, however, in their winter costume, the superior size and bulk of *L. saliceti*, its more densely-clad feet and tarsi, thicker bill, and the absence of black between the bill and eyes, have afforded ready means of discrimination.

A season or two ago, Mr. Bartlett obtained, in the market, a recent specimen of *Salicaria turdoides*, which is still in his possession. This bird, which is very like *S. arundinacea*, but on a larger scale, is rather common in the low countries, and may occur, it is not unlikely, now and then in the markets of Essex, where there is considerable chance of its being overlooked. Its size (but this only) has caused it to be ranged among the Thrushes by superficial naturalists.

Were I to enumerate the acknowledged British species, of moderately rare appearance, which have been met with at different London poulterers during the past twelvemonths, my list, already tolerably long, would be considerably extended. It must suffice, for the present, to advert very briefly to one or two others, selected from among the most interesting.

A young Black-throated Loon (*Colymbus Arcticus*) occurred in the autumn, and an old specimen early in January, 1836. The former measured 2 feet $3\frac{1}{2}$ inches in length, and 3 feet $8\frac{1}{2}$ inches in spread of wing.

An Avocet, and a Greenshank, in full summer aspect, both very seldom to be purchased here, were brought in the spring; and two Dusky Sandpipers (*Totanus fuscus*) at the end of August. In September, twenty Curlew Tringas were obtained together, all young birds of the year except one; and about half a dozen of *Tringa minuta*.

Astonishing numbers of the Pomarine Skua (*Lestris pomarinus*) appeared in November, both on the eastern and southern coasts of England; many of these were brought to market, and as many as eight or ten of them alive; but they did not prosper in confinement, and generally died, almost suddenly, in the course of a few weeks. They were all in immature plumage, which varied somewhat in different individuals; the males were, on an average, rather smaller than the other sex, and were further distinguished by having the central tail-feathers somewhat elongated. A single young specimen of the Common Skua (*L. catarrhactes*), also, was purchased in the market, but neither of the other species.

The only rare Gulls which I have seen were two specimens of *Larus glaucus*, one a bird of the year, the other of the preceding year, but still unmoulted.

A Velvet Scoter, in a very emaciated state, was obtained during the severe frost; and about the same time Mr. Hoy procured two in Suffolk, in equally reduced condition. This bird I never previously knew to occur in the London market, except during the winter, I believe, of 1832–3, when it was not uncommon. A few seasons ago, Mr. Bartlett received a recent Surf Scoter (*Oidemia perspicillata*) for the purpose of stuffing; and he has also seen an immature Red-crested Pochard exposed for sale.

I shall conclude this notice by recording the fact of eleven Greylag Geese (*Anser cinereus*) having been brought in the course of the winter; three of them occurred in November, five in January, and the other three in March. Few naturalists are aware how rare in Britain, and how little known to the majority of British ornithologists, even of those who think they are acquainted with it, is this species of "Wild Goose." One constant character by which it may be recognized is the pale grey colour of the rump, which in the other species is always very dark brown.

A LIST OF BIRDS FOUND IN MIDDLESEX.

By H. J. Torre.

I beg to thank you for the kind manner in which you noticed my letter (p. 313) of last month, and fully perceive the error I committed in concealing my name. Following the example of some of your other correspondents, I subjoin a list of birds which have been found in this neighbourhood during the last seven or eight years. I think it may be considered correct, as by far the greater part I have myself observed; and the remainder—to which a mark (†) is prefixed—I have received from a respectable animal-preserver of this town. Should you have already received an ornithological list from Middlesex, or find deficiencies in this, you will of course have no scruples in dispensing with it.*

Order I. Raptores, Preyers.

Falcon family, *Falconidæ.*—Kestril Falcon, *Falco tinnunculus;* †Merlin Falcon, *F. æsalon;* Hobby Falcon, *F. subbuteo;* Sparrow Hawk, *Accipiter nisus;* †Common Buzzard, *Buteo vulgaris.*

* As Mr. Torre has done us the honour of adopting the nomenclature of our *British Song Birds* as regards the native choristers, and since he had employed that of M. Temminck for the other species, we have taken the liberty of substituting more modern names for the latter, and of adding the family designations, both English and Latin—an arrangement, we trust, which will meet the approbation of our correspondent.—Ed.

OWL FAMILY, *Strigidæ.*—†Long-eared Madge, *Otus vulgaris;* Short-eared Madge, *O. brachyotus;* Tawny Hooter, *Ulula stridula;* Barn Owl, *Strix flammea.*

ORDER II. INSESSORES, PERCHERS.

SWALLOW FAMILY, *Hirundinidæ.*—Chimney Swallow, *Hirundo rustica;* House Swallow, *H. urbica;* Sand Swallow, *H. riparia;* Common Swift, *Cypselus apus.*

NIGHTJAR FAMILY, *Caprimulgidæ.*—European Nightjar, *Caprimulgus Europæus.*

HALCYON FAMILY, *Halcyonidæ.*—Common Kingfisher, *Alcedo ispida.*

FLYCATCHER FAMILY, *Muscicapidæ.*—Spotted Flycatcher, *Muscicapa grisola.*

SHRIKE FAMILY, *Laniadæ.*—†Grey Shrike, *Lanius excubitor;* Red-backed Shrike, *L. collurio.*

THRUSH FAMILY, *Turdidæ.*—Missel Thrush, *Turdus viscivorus;* Fieldfare Thrush, *T. pilaris;* Garden Thrush, *T. hortensis;* Redwing Thrush, *T. Iliacus;* Garden Ouzel, *Merula vulgaris;* Ring Ouzel, *M. torquata.*

WARBLER FAMILY, *Sylviadæ.*—Fallow Chat, *Saxicola œnanthe;* Whin Chat, *S. rubetra;* Stone Chat, *S. rubicola;* Robin Redbreast, *Rubecula familiaris;* Tree Redstart, *Phœnicura albifrons;* Sedge Reedling, *Salicaria phragmites;* [Brake Nightingale, *Philomela luscinia.*—ED.]; Blackcapt Fauvet, *Ficedula atricapilla;* Garden Fauvet, *F. hortensis;* Whitethroated Fauvet, *F. cinerea;* Garrulous Fauvet, *F. garrula;* Wood Warbler, *Sylvia sibilatrix;* Willow Warbler, *S. melodia;* Golden-crowned Kinglet, *Regulus auricapillus;* Garden Tit, *Parus hortensis;* Blue Tit, *P. cæruleus;* Marsh Tit, *P. palustris;* Coal Tit, *P. ater;* Longtailed Tit, *P. caudatus;* Hedge Dunnock, *Accentor modularis;* Pied Wagtail, *Motacilla maculosa;* Spring Oatear, *Budytes verna;* Tree Pipit, *Anthus arboreus;* Meadow Pipit, *A. pratensis.*

FINCH FAMILY, *Fringillidæ.*—Sky Lark, *Alauda arvensis;* Wood Lark, *A. arborea;* †Snowy Longspur, *Plectrophanes nivalis;* Corn Bunting, *Emberiza miliaria;* Yellow Bunting, *E. citrinella;* Reed Bunting, *E. schœniculus;* Cirl Bunting, *E. cirlus;* House Sparrow, *Passer domesticus;* †Tree Sparrow, *P. arboreus;* Chaff Finch, *Fringilla cœlebs;* Bramble Finch, *F. montana;* Siskin Goldwing, *Carduelis spinus;* Common Goldwing, *C. elegans;* Whin Linnet, *Linaria cannabina;* Mountain Linnet, *L. montana;* Redpoll Linnet, *L. pusilla;* Green Grosbeak, *Coccothraustes chloris;* Haw Grosbeak, *C. cratægus;* Common Crossbill, *Crucirostra vulgaris;* Hedge Coalhood, *Pyrrhula vulgaris.*

STARLING FAMILY, *Sturnidæ.*—Spotted Starling, *Sturnus varius.*

CROW FAMILY, *Corvidæ.*—Carrion Crow, *Corvus corone;* †Hooded Crow, *C. cornix;* Rook Crow, *C. frugilegus;* Jackdaw Crow, *C. monedula;* Common Magpie, *Pica melanoleuca;* Common Jay, *Garrulus glandarius.*

WOODPECKER FAMILY, *Picidæ.*—Green Woodpecker, *Picus viridis;* Pied Woodpecker, *P. major*; †Barred Woodpecker, *P. minor;* Zigzag Wryneck, *Yunx torquilla.*

NUTHATCH FAMILY, *Sittidæ.*—European Nuthatch, *Sitta Europæa.*

CREEPER FAMILY, *Certhiadæ.*—Common Creeper, *Certhia familiaris;* Ivy Wren, *Anorthura troglodytes.*

CUCKOO FAMILY, *Cuculidæ.*—Grey Cuckoo, *Cuculus canorus.*

ORDER III. RASORES, SCRATCHERS.

PIGEON FAMILY, *Columbidæ.*—Ring Pigeon, *Columba palumbus*; Rock Pigeon, *C. livia*; Turtle Dove, *Peristera turtur.*

GROUS FAMILY, *Tetraonidæ.*—Grey Patridge, *Perdix cinerea*; Common Quail, *Coturnix vulgaris.*

ORDER IV. GRALLATORES, WADERS.

HERON FAMILY, *Ardeidæ.*—Common Heron, *Ardea cinerea*; †Common Bittern, *Botaurus stellaris.*

SNIPE FAMILY, *Scolopacidæ.*—Common Curlew, *Numenius arquata*; Wood Snipe (or "Woodcock"), *Scolopax rusticola*; Common Snipe, *S. gallinago*; †Great Snipe, *S. major*; Jack Snipe, *S. gallinula.*

RAIL FAMILY, *Rallidæ.*—†Water Rail, *Rallus aquaticus*; Corn Crake, *Crex pratensis*; Common Gallinule, *Gallinula chloropus*; Common Coot, *Fulica atra.*

PLOVER FAMILY, *Charadriadæ.*—Peewit Lapwing, *Vanellus cristatus*; Golden Plover, *Charadrius pluvialis.*

ORDER V. NATATORES, SWIMMERS.

DUCK FAMILY, *Anatidæ.*—White-fronted Goose, *Anser erythropus*; Greylag Goose, *A. palustris*; Mallard Duck, *Anas boschas*; Common Teal, *Querquedula crecca;* Common Wigeon, *Mareca Penelope*; †Tufted Pochard, *Fuligula cristata*; Hooper Swan, *Cygnus ferus.*

DIVER FAMILY, *Colymbidæ.*—Little Grebe, *Podiceps minor*; †Crested Grebe, *P. cristatus.*

AUK FAMILY, *Alcadæ.*—†Black Guillemot, *Uria grylle.*

GULL FAMILY, *Laridæ.*—Common Gull, *Larus canus;* Kittiwake Gull, *L. rissa.*

The above catalogue includes 113 species.

Harrow, June 4, 1838.

CORRESPONDENCE.

GEOLOGY AND SCRIPTURE.

To the Editor of the Naturalist.

Esholt Hall, near Leeds, June 11, 1838.

DEAR SIR,—Yesterday I duly received your present of *The Naturalist* for June, for which I return you my sincere thanks; and beg to say that I have been highly gratified in the perusal of the articles therein—especially by your remarks on Professor PHILLIPS's *Treatise on Geology;* for, having read some works on Geology by authors of different opinions, who all seem desirous of promulgating their own favourite theories, I have been forced to the conclusion that Geology can only be profitably studied on the distinctive principle as regards science and sacred history.

ON THE FORMATION OF CHARCOAL FROM PLANTS EMBEDDED IN SANDSTONE.

We have good specimens of the Cactuses in the *Caillaird* of this neighbourhood. I found the matrix of one some time ago, which clearly shews the footstalks of the leaves. We have likewise several specimens of Arundinaceous plants [Reeds, &c.—ED.] in the Sandstone, which, when taken out of the stone, are generally found embedded in Charcoal. As to the process which the bark of the tree would have to undergo in being converted into Charcoal, I most respectfully beg leave to ask you the following question:—Is it possible that Charcoal can be the result of a slow and gradual chemical decomposition of the bark under the waters of the ocean, or has it been converted into Charcoal by the action of the heat?

I shall take an opportunity of introducing *The Naturalist* to some of my friends in this part of the country who are likely to take an interest in the work.

I have the honour to remain,

Dear Sir, yours respectfully,

JAMES PRINGLE.

To NEVILLE WOOD, Esq.,
Campsall Hall.

[The query propounded to us is of difficult solution without a more accurate idea of the situation, &c., of the plants alluded to than has been imparted to us. We believe, however, that the intervention of heat would not be required in the case alluded to. The Sandstone strata consist of subaqueous deposits. It must, therefore, in all probability have been by a gradual chemical action that the change from bark to Charcoal has been formed. There is very little doubt but

that the world has once been of a considerably higher temperature than at present. Now this high temperature affected fluids as well as solids, and would unquestionably accelerate the carbonization. We may, then, safely conclude that subaqueous chemical decomposition, assisted by heat, effected the change.—Ed.]

Difficulty of Framing an Entomological Glossary.

To the Editor of the Naturalist.

My dear Sir,—In a recent letter I stated that I should not be able to furnish the promised (p. 249) articles on Orismology, and take the earliest oppor-opportunity of explaining the reason of my having abandoned the project. The plan I laid before you was feasible enough in theory; but when I came to apply my views practically, I soon found that they would not answer. A repetition of terms would have been unavoidable; and if I were to proceed on the plan of giving *general* and *partial* Orismology, the extent of the glossary would be such as I think could not properly be allowed in *The Naturalist.* I feel, therefore, compelled to relinquish my design.

Believe me, yours most faithfully,

Bewsey House, Warrington, Peter Rylands.
May 19, 1838.

[If, after this explanation, any of our readers are particularly in need of such a glossary, and would be greatly assisted by it, we doubt not Mr. Rylands will kindly contrive to vanquish the difficulty alluded to.—Ed.]

CHAPTER OF CRITICISM.

Observations on Mr. Wood's "British Song Birds," passim.

To the Editor of The Naturalist.

Dear Sir,—I must apologize for having so long neglected to send you the few remarks I had to make on the perusal of your *Brit. Song Birds;* but want of leisure, not want of inclination, must plead my excuse. The said remarks were never committed to paper, and I merely made notes in pencil on going through your pages. However, let me now begin without further preface. I will take things as they occur.

1. P. 22, speaking of the song of the Thrush, you say "the top branch is invariably chosen for the vocal performance." Surely this is not exactly correct,

at least not with our Warwickshire Thrushes, which I have often observed. They generally sit high in the tree, but not on the "top branch."

2. P. 64. "Containing fruit which are of course unattainable to its tender beak." Not clearly expressed, and surely not correct in fact, is it? Why do you call it the *Tree* Redstart?

3. "Brake Nightingale." Are there really more than one species in England? This bird sings as much by day as by night; but at night he has it all to himself, and so is more remarked. When at Oxford I observed a Nightingale singing on the bough of a tree which hung over the turnpike-road from Kedington Hill, in the middle of the day.

4. P. 99. The Blackcap "arrives in the middle or towards the end of April." Earlier generally. I have heard him even in March; he is among our first summer visitants.

5. P. 165–6. From what Dr. Liverpool states, we might infer that the Tits do not crack nuts, and you yourself (in the foot-note) do not seem to be aware of the fact. I have often observed them here striking nuts with their beaks, as the Nuthatch does.

6. The Longtailed Tit on my premises sometimes builds in Gorse (*Ulex*) and Box, and frequently in Blackthorn. I never saw more than one hole to the nest; certainly two are not usual.

7. You have some excellent remarks at p. 220, under the head of "Spring Oatear," about "birds which actually do good where they are supposed to be most mischievous." But are you not going too far in saying that the Nightjar "leaps up at the Cows' udders and legs, in order to obtain the insects and larvæ lodged in the poor animal's skin"? I much doubt its taking any insects but such as are on the wing.

8. P. 267. "Though I never heard this bird [the Wood Lark] make any attempt at a song in winter," &c. It *does* sing beautifully in winter, as I used often to hear it when a boy, before the Christmas holidays were expired; it also sings very much in autumn.

9. P. 346. "In the middle of March **** the Chaff Finch commences its merry and oft-repeated strains." Long before this time—in February, and sometimes in January; I have even heard him in December, but always, I think, before the middle of March. I consider him to afford one of the very first indications of spring, and accordingly he is a great favourite with me, notwithstanding his mischievous propensities in the garden.

10. P. 371. The generic name *Linaria* is inadmissible, being preoccupied as such in Botany for several species of Toadflax.

11. P. 379. You speak of the Redpoll as a *shy* bird. I well remember, when a very young sportsman, or rather a young carrier of a gun, falling in with a flock

of Redpolls feeding on the seeds of the Alder; after firing at them, I found that they returned to the very same tree (though I was standing under it) before I could reload my gun. This they did *many times*, and with a perseverence which I shall not easily forget.

12. P. 405. You speak of the Starling as being a "difficult bird to shoot." No bird of its size (as it appears to me) is more easy to approach within gun-shot, either in summer or winter. I don't believe they suck Pigeons' eggs; do you? They are amusing birds, and you describe their winter concerts admirably at p. 405.

13. I forgot to say, when speaking of the Nightjar, that *I* would not discard the old name *Caprimulgus*, because it seems to record, as it were, *historically*, the superstitious notions that have been entertained respecting it. No one in these days, I should suppose, except, perhaps, the very ignorant, could believe that it really did suck Goats, Cows, or anything else; and such persons—if such there be—would not understand the meaning of the word *Caprimulgus*. "Night-jar" (an excellent name) I much prefer to "Goatsucker."

14. Why did you not refer to Bewick's *figures*, as contained in his popular work? For though his letter-press is no very good authority, his admirable wood-cuts must always be held in estimation.

15. I have also a "Crow to pick" with you for not having enumerated the Swallows among your British song birds. That title is, of course, to be understood in a large and liberal sense, for you include under it many birds that have no pretensions to song; but surely the Swallow (*Hirundo rustica*) is, *boná fide*, a legitimate songster. He has, ere now, kept me awake at day-break, or before, by his persevering music, which is moreover highly agreeable. And the harsh scream of the Swift, too, delights me as much as the note of any bird whatever. I am not certain that I do not prefer it even to the sweet melody of the Nightingale himself; but here comes the association of ideas.

I have written as briefly as possible, in order to come within the compass of a single sheet,

Believe me, dear Sir,

Very truly yours,

Allesley Rectory, near Coventry, W. T. Bree.

May 9, 1838.

[1. We believe the remark of Mr. Bree to be generally, though not universally correct. We have noticed both cases.—2. Orchards do not commonly foster trees producing fruit softer than cherries, which would probably be inaccessible to the tender beak of the Redstart. This is what we have stated in other words at the passage alluded to; and if the expression was obscure, we can only regret the

circumstance. The name "Tree Redstart" did not originate with us; and was only adopted for its superiority over "Common." If, however, English names are of any importance in a scientific point of view, both "Tree" and "Common" ought to be discarded.—3. Had there been two British Nightingales, we should not have been backward in announcing England's good fortune in this respect. The addition of an English specific name is only in accordance with the uniform plan pursued throughout the volume.—4. This depends very much upon season and latitude.—5. This of course settles the matter.—6. The remark accords with the experience of almost every naturalist, and likewise with our own. Two holes have, however, been seen in the nest.—7. Our observation is supported by that of CHARLES WATERTON, Esq., in his *Wanderings*, 2nd edit., p. 143.—8. The observation is valuable.—9. The season here has a remarkable effect. Protracted winds will silence every chorister of the grove for weeks together. We have heard many birds sing in December and January which, nevertheless, commonly commence and regularly set in for the season in April. The Chaff Finch is, however, an early singer.—10. Whether Botany or Ornithology has priority in this instance, we are not at present prepared to decide.—11. Had Mr. BREE taken the subsequent paragraph into consideration (*Song Birds*, p. 380), he would have found that no difference exists between us on this head. While feeding, Cautiousness is absorbed, as it were, by Gustativeness.—12. In winter we find it shy, in summer not. In the latter season Philoprogenitiveness becomes more powerful than Cautiousness. That this bird sucks eggs, is contrary to our entire experience.—13. This is a new view of the case. Perhaps the balance is in favour of retaining the old name.—14. This might have been useful to the student, although we do not chime in with the indiscriminate admirers of the great artist.—15. Our Preface ought to have explained that our book was written before it was christened; and that the least objectionable of several titles was then selected. The Swallows, accordingly, did not enter into the original plan; further, had the Swallow been included on the score of musical ability, the Jay would put in a claim of at least equal force. The casual observer who has merely noticed the harsh scream of the Jay, may probably be inclined to split his sides with laughter at the thought of its being called a "song bird;" but Mr. BREE must have heard its soft and singular melody.

We have to thank Mr. BREE for the kind and candid manner in which he has penned the above remarks; and may perhaps be allowed to congratulate ourselves upon the circumstance that in a volume of upwards of 400 closely-printed pages, containing no trifling mass of observations and opinions, so excellent a practical naturalist as our amiable correspondent has found so little to find fault with.—ED.]

EXTRACTS FROM THE FOREIGN PERIODICALS.

ZOOLOGY.

1. Hybernation of Swallows.—M. Isidore Geoffroy, in his zoological instructions, drawn up for the new scientific expedition to the north, calls upon naturalists to observe any facts which they may meet with concerning the hybernation of Swallows. In consequence of this, M. Dutrochet communicates to him, that he found two of these birds in a state of torpor, in a recess, formed in the wall of a building. On being warmed by the hand they flew away, proving thereby, that Swallows are occasionally capable of wintering in a northern climate. To this M. Larrey adds, that in the valley of Maurienne he saw a deep grotto in a mountain, called L'Hirondellière, because it is covered with Swallows at the beginning of winter. In this the birds were suspended, like swarms of Bees, in the corners of the roof.

2. Sponges.—M. Dujardin having repeated his observations on *Spongillæ*, or fresh-water Sponges, as well as others on marine Sponges, thinks he has proved that these ambiguous beings are positively groups of animals, capable of contraction and extension. If a piece be detached from a living Sponge, and submitted to a microscope, it will be seen to group itself into irregularly rounded masses, and change the form of its edges incessantly; isolated portions, detached from the general mass, move slowly in the liquid, and creep along by means of their alternate contraction and expansion.

3. Extravagant feathered Architect.—Dr. Coko, of Westchester, recently took a bird's nest which was entirely framed of silver wire. It was the nest of a Hanging-bird, found on a Sycamore tree, the extravagant little builder having probably stolen some young lieutenant's epaulette to form his future nursery with.—*New York paper.*

4. Silkworms.—The experience of M. Bonafous proves the efficacy of the Chinese method of feeding Silkworms on Rice flour; and he has even gone further, and discovered that these caterpillars will eat various kinds of farina, and even the fecula of Potatoes.

5. Malayan Albino.—On landing at Gressik I was struck by the singular appearance of a Malay lad, an albino, standing under the shade of a tree on the river bank. His skin was of a reddish white, with blotches here and there, and thinly covered with short white hairs. The eyes were small and contracted; the iris of a very light vascular blue; the lids red, and fringed with short white lashes; the eyebrows scant and of the same colour; the pupil much contracted

from the light. On calling him to come near he appeared to be ashamed. He evinced an extreme sensibility to the stimulus of light, from which he almost constantly kept his eyes guarded by shading them with his hands. He told me he could see better than his neighbours in imperfect darkness, and best by moonlight, like the "moon-eyed" albinos of the Isthmus of Darien. He is morbidly sensitive to heat: for this reason, and on account of the superstitious respect with which the Malays regard him, he is seldom employed by his friends in outdoor labour, although by no means deficient in physical strength. The credulous Malays imagine that the Genii have some furtive share in the production of such curiosities, though this they tell as a great secret. To this day the tomb of his grandfather, who was also an albino, is held sacred by the natives, and vows (*niyats*) are made at it. Both his parents were of the usual colour. His sister is an albino like himself. Albinos, I believe, are not common on the peninsula, nor are there any tribes of them, as according to VOLTAIRE, existing in the midst of Africa. In the only two instances I recollect observing, the eyes were, in both, of a very light blue; the cuticle roughish and of a rosy blush, very different from that of the two African albinos seen and described by VOLTAIRE, and quoted by LAWRENCE.—*Journal of the Asiatic Society of Bengal.*

BOTANY.

6. ON VEGETABLE ACIDS.—It is very probable that the acid of Turnips, Cucumbers, &c., is simply acetic acid. Many other plants exist in which particular acids have been discovered, the composition of which is unknown; but it may be affirmed, with much probability, that, if all those acids were carefully examined, they would be reduced to a very small number. M. LIEBIG, in his *Annal. der Pharm.*, for Nov. 1837, recommends naturalists to examine this subject; reminding them that the acid of fruits changes after their arrival at maturity; that, for example, the fruit of the Mountain-ash contains, during the first month, tartaric acid; later, tartaric and citric acid; and, finally, malic acid only.—*Bibliothèque Universelle de Genève.*

GEOLOGY.

7. FOSSIL SALAMANDER.—M. PARAVEY has written to the French Academy of Sciences, that a fossil Salamander, in the collection of Prof. VAN BREDA, at Leyden, about three feet long, contains, in the part corresponding with the abdomen, the fragments of Frogs, Eels, &c., thereby affording a proof that antediluvian species fed upon the same substance as the Salamanders of our times. A large Salamander brought by M. SIEBOLD, from Japan, still lives in the museum at Leyden, and is principally fed with Frogs. The above-mentioned traveller brought the male and female into Europe, but the latter was devoured

by the former, after he had been for some time without food. This Salamander is described in the *Japanese Encyclopedia*, and M. Paravey finds in this work the same fables which exist in Europe concerning this animal, namely, its insensibility to fire. The same stories concerning the Chameleon are also found in this Encyclopedia, and bring further conviction to M. Paravey, that a very ancient centre of civilization has existed, whence come the ideas concerning art and science which have been transmitted to us by the Greeks and Romans, and which are to be found in Chinese books.

8. Narrow-toothed Mastodon.—At least half a skeleton of the Narrow-toothed Mastodon has been found by M. Lartet, at Gers, in excellent preservation. The half of the lower jaw distinctly presents the socket of a powerful incisor, of which also a fragment has been found. The existence of incisors in *Mastodon angustidens* does not accord with the observation of Cuvier, and it becomes a matter of discussion whether a new species exists, or whether this anomaly is a sexual distinction.

9. Tombs in Santorini.—Some tombs discovered in the island of Santorini by M. Bory St. Vincent, give an importance to this island beyond that of its volcanic celebrity. We pass over ruins of temples, cities, cyclopean walls, cisterns, &c., to the account of vases found in some of the ancient tombs, which have been laid bare by the torrents of rain, and so deprived by the mass of Tufa Pumice, &c., under which they have for ages lain hidden. One was about sixteen inches high, and nine in diameter, with a narrow neck, the orifice of which was formed of the head of an Eagle or Griffin; a graceful and light handle was beautifully adapted to the body of the vase; the colour was that of Blood-stone, and, apparently, a Lynx devouring a Stag with branching horns, was designed upon it in black. This was discovered in the least ancient of the tombs (for there are some of much greater antiquity than others, apparently formed by an unknown race), and contrasted, in richness of ornament and shape, with the older pottery. This latter is of a hard, sonorous material, full of grains, perhaps Sandstone. The largest vase is two feet five inches high, and one foot nine inches in diameter in the middle, and it had four handles; a second had only two handles, and probably contained a provision of grain for the deceased. The stone has not been artificially coloured except with bands of a chocolate brown, and on one side only have been sketched an imperfect meander, circles, zigzags, cranes, &c. &c.; the other side has no ornament, as it was intended to stand close to the wall.

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

ENTOMOLOGICAL SOCIETY.

May 7.—J. F. Stephens, Esq., Pres., in the chair.—Mr. Sells exhibited specimens of the rare *Copris lunaris*, and of the curious cocoon in which it passes the pupa state. Mr. Ashton presented a figure of a specimen of *Notonecta furcata*, infested by a minute parasite which attaches itself to its leg; and Mr. Aldous presented his highly-magnified figure of the head of the Flea, as represented under the solar microscope, exhibiting all the parts of the mouth, respecting which so much uncertainty had prevailed.—Various other exhibitions were made by members, and a discussion took place as to the nature of the food of the Bot of the Horse; Mr. Sells maintaining that it was nourished upon fluids from the vascular structure of the Horse's stomach, in opposition to the opinion of Mr. Bracy Clark, that they fed upon chyle or chyme.—The Rev. F. W. Hope communicated a table of the genera and species of insects infested by *Filariæ* and other parasitic Worms. —The commencement of a monograph on the Coleopterous genus *Popillia*, by Mr. Newman, was read.

ORNITHOLOGICAL SOCIETY.

May 5.—J. R. Gowen, Esq., in the chair.—The report of the Council stated that the Hon. P. C. Scarlett, M.P., the Hon. J. Y. Scarlett, M.P., C. B. Brown, Esq., and Mr. E. Mammatt, had been elected members of the Society. A donation of specimens had been received from the Lady Rolle; and it was announced that the Commissioners of Her Majesty's Woods and Forests had caused some ponds and shallows to be made on the larger island in St. James's Park, in compliance with a request to that effect made to them by the Council of the Society.—The Council had not had time to act upon the system determined on in the recently-passed bye-laws for the removal and election of officers and members of the Council; but they proposed to act upon it as fully as the time would allow. They had, therefore, to announce that they propose the Duke of Buccleugh to be elected President in the room of the Earl of Liverpool, Mr. W. Holl to be Secretary, and F. B. Long, Esq., to be Treasurer; the following noblemen and gentlemen to retire from the Council:—his Grace the Duke of Bedford, W. G. Chapman, Esq., the Earl of Liverpool, Capt. Mangles, R.N., and Sir J. D. Paul, Bart.; and the following to be elected in their stead:—his Grace the Duke of Buccleugh, the Hon. P. C. Scarlett, M.P., F. B. Long, Edward Jesse, and O. Morgan, Esqrs.

Mr. Blyth then exhibited specimens of the three wild British Geese allied to

the domestic breed, viz., the Grey Goose (*Anser cinereus*), the Bean Goose (*A. segetum*), and the White-fronted Goose (*A. albifrons*); all which are promiscuously sold in the markets under the general name of "Wild Geese." The first of them was stated to be the primitive stock of the domestic Goose, and to have become of exceeding rare occurrence in the British Islands, although it formerly bred plentifully in the fens. Until very recently, no specimen of it existed, that he could learn of, in any of the London museums; but aged examples of the Bean Goose, that had the terminal *nail* of the beak white, were commonly ticketed with its name. It differed, however, in various particulars, which were pointed out, and might always be at once told by the pale grey colour of the rump, which in both the others is very dark brown. The Bean Goose was mentioned as the ordinary "Wild Goose" of these islands, which it annually visits in large flocks, frequenting upland pastures, where neither of the others are ever seen. It was the only species of the three brought to market during the continued severe weather of last winter, when thousands of them were daily exposed for sale.

A paper on the Natural History of the Nightingale (published in our number for July, p. 343) was afterwards read by Mr. Blyth.

The anniversary meeting was held on Friday the 18th of May, N. W. Ridley Colborne, Esq., in the chair.—The Council, in their report, congratulated the members on the position which the Society had already attained. The number of its members was stated to be 205; a number probably unprecedented in the first year of any other scientific society. Reference was then made to the great injury which the collection in St. James's Park at first sustained, from the children and other frequenters of the Park: but the Council had now the satisfaction of reporting, that a marked improvement in this respect might be observed; and they are convinced that the gratuitous exhibition of living birds will have a powerful effect in combating the childish propensity to tease and torture animals, and in substituting an intelligent interest in their welfare. Little more than a nucleus of the museum and library has as yet been formed; but the Council expressed a confident hope, that, with the valuable services of the curator, Mr. Blyth, a sufficiency of specimens for the illustration of the monthly lectures will very shortly be obtained. The accounts of the Society for the last year had been audited, and the balance in hand was £11. 16*s*. The sums then owing by the Society were £36. 17*s*. 9*d*.; and the sums owing to the Society were £42. The bye-laws have been printed and distributed.

Some admirably-mounted specimens of rare birds were afterwards exhibited by Mr. Blyth, which had been obtained in the London markets. Among them was the elegant Squacco Heron (*Ardea ralloides*), an exquisite specimen in fully adult plumage, and which had recently been shot in Suffolk; and the little Hazel Grous (*Tetrao bonasia*) of Continental Europe, the old-world analogue of the

well-known Ruffed Grous of North America, forming with it a distinctly-characterized genus, with partly naked legs. Mr. Blyth then discoursed at some length on the general structure of the class of Birds, and exhibited analogous portions of the skeletons of various groups, to illustrate the variations which they presented. He dwelt especially on the importance of studying all parts of an animal's structure, in order to attain a just idea of its systematic relations. The necessity of a knowledge of Anatomy in the investigation of zoological classification is so obvious, that it seems surprising that its utility should ever have been questioned; but probably the too exclusive use made of this valuable assistant by some naturalists may have induced the obloquy into which it has sunk even among some of our leading zoologists.—Mr. Blyth expressed a wish that the museum of the Society should be select rather than extensive, affirming that a comparatively small number of species, illustrative of the principal types or models of structure, would amply suffice for scientific purposes, if exhibited in all the progressive stages of their outward covering, and also in the various differential details of their anatomy.—N. A. Vigors, Esq., M.P., D.C.L., followed, with some observations to the same effect, remarking how necessary it is for those who wish to advance scientific Zoology, to penetrate somewhat deeper than the mere surface. Of course no classification could be relied on which was founded only on one system of organs, whether they were external or internal; it was on the totality of character that the natural system reposed, upon the whole rather than upon a part; and an arrangement based on the entire conformation must necessarily be permanent, and constitute a secure foundation on which to generalize.

GEOLOGICAL SOCIETY.

Feb. 21.—Rev. Wm. Whewell, Pres., in the chair.—A paper was read on part of Asia-Minor, by W. J. Hamilton, Esq., Sec.G.S. This memoir gave a detailed account of the author's observations on the geological structure of the country from Mount Hassán Dagh, near Akserai (lat. 38° 20' N., long. about 34°) to the great salt lake of Toozla, Kodj-hissar, and thence eastwards to Cæsarea and Mount Argæus.

March 7.—The Pres. in the chair.—A notice, by H. E. Strickland, Esq., F.G.S., of Cracombe House, was read, on some remarkable dikes of Calcareous Grit, which intersect the Lias Shale, on the shore at Ethie, in Ross-shire. These dikes were noticed by Mr. Murchison, in 1826. Mr. Strickland offered no explanation of their origin, but wished to draw the further attention of geologists to the phenomena which they present.—A paper by Charles Darwin, Esq., Sec.G.S., was then read, " On the connection of certain volcanic phenomena,

and on the formation of mountain chains, and on volcanos as the effects of Continental elevations."

March 21.—The Pres. in the chair.—A paper was read by Mr. Owen, on the dislocation of the tail, at a certain point, in the skeletons of many *Ichthyosauri.*—An essay on the primary formations of England, by the Rev. Adam Sedgwick, V.-P.G.S., was then commenced.

April 4.—The Pres. in the chair.—A description of Lord Cole's specimen of *Plesiosaurus macrocephalus*, by Mr. Owen, was read.

April 25.—R. I. Murchison, Esq., V.-P., in the chair.—Three communications were read :—1. A notice of the occurrence of Wealden strata at Linksfield, near Elgin, by Mr. Malcolmson, F.G.S. ; 2. Notes on a small patch of Silurian rocks to the West of Abergele, Denbighshire, by Mr. J. E. Bowmall ; 3. On the origin of the Limestones of Devonshire, by Mr. Austen, F.G.S.

BOTANICAL SOCIETY.

April 20.—Dr. MacIntyre, F.L.S., in the chair.—The Secretary read a paper from A. Wallis, Esq., on the genus *Myosotis*. *Myosotis arvensis* is most usually found in Corn-fields, or other highly-cultivated land, where it sometimes reaches a considerable height. *Myosotis sylvatica* is mostly found in shady places, where it assumes a stouter form than *M. arvensis;* the bristles of the stem are shorter, and the leaves will generally be found longer than those of *M. arvensis.* But would not the difference of soil and situation account for the more luxuriant growth of the one than of the other? There is another distinction, also, for which neither soil nor locality would account; it is, that the calyx of *M. sylvatica* is more deeply cleft than that of *M. arvensis*, and the tube of the corolla is longer in the former than in the latter; but Mr. W. was inclined to doubt whether these were sufficient to justify a specific distinction, and the more particularly so when we recollect that many plants are subject to slight variations in their structural minutiæ. Admitting then that a difference of soil operates so powerfully in producing such varied and perhaps permanent distinctions of character, it will become a subject worthy attention how this peculiar operation takes place, and whether by close observation on the soil as well as locality, we may not be able to establish geological laws relating to it.

HORTICULTURAL SOCIETY.

May 1.—Dr. Henderson, V.-P., in the chair.—A letter was read from Mr. Disney, of Chelmsford, on the cultivation of Strawberries.—A considerable number of fine fruits, flowers, and vegetables, were exhibited by Mr. Luscombe ; Sir C. Lemon, Bart., M.P. ; Mr. Ferguson, gardener to P. C. Labouchere, Esq. ;

Mr. Sprengal, gardener at Taplow Lodge, Bucks.; Mr. Naylor; Messrs. Brown; Mrs. Lawrence; Mr. Spence, gardener to R. Durant, Esq.; Miss Garnier; Mr. Beaton, gardener to T. Harris, Esq.; Mr. Harrison, of Aigburgh, near Liverpool; Messrs. Chandler; Mr. Crayshaw (Esq.), through W. H. Pepys, Esq.; Mr. Niemann, the Dutch gardener to P. C. Labouchere, Esq.; Sir Simon Clark, Bart.; and Mr. Hartweg, the Society's collector.

The Anniversary Meeting was held on May 1, Mr. George Bentham in the chair, who announced that the President, T. A. Knight, Esq., had arrived in London, the day previous, for the purpose of presiding, but that his attendance had been prevented on the grounds of indisposition. (See Obituary, p. 396.)

The following is an extract from the report of the Auditors:—"The Auditors have the pleasure to present to this Annual Meeting of The Horticultural Society of London, being the twenty-ninth since its incorporation by Royal Charter, an abstract of the accounts for the past year, showing a surplus of income over expenditure to the amount of £1,557. 15*s.* 2*d.*"

METROPOLITAN SOCIETY OF FLORISTS AND AMATEURS.

The Auricula Show was held on May 2, in the rooms of the Royal Society of Horticulture, at the Egyptian Hall, and it was announced that several extra prizes for other objects of exhibition would be distributed. This had the effect of bringing together a very interesting collection, as the show, instead of being confined to the amateur of this interesting individual plant, was one of a general nature. The room is decidedly the best in town where any floral exhibition could be held, and from the arrangement of light in the building, the flowers looked well, and displayed every perfection. Since our last visit, we find another addition to the embellishments in the shape of a looking-glass of extraordinary magnitude, which occupies nearly the whole breadth of the room, and being placed opposite the one at the bottom of the stairs, presents to the eye the interesting and singular delusion of an almost interminable series of floral corridors. —*Mining Journal, May* 5, 1838.

ZOOLOGICAL SOCIETY.

April 30.—The Right Hon. the Earl of Derby in the chair.—The anniversary meeting was held this day, at the Museum, 28, Leicester-square. The report (for which see the *Gardener's Gazette*, Supplement, May 5) appeared on the whole favorable, although there was a considerable falling off in the receipts for some departments. This was ascribed, by N. A. Vigors, Esq., M.P., to a want of liberality on the part of the council.—The following officers were elected:—*Treasurer*—Charles Drummond, Esq.; *Secretary*—Rev. John Barlow, F.R.S.; *Council*—Dr. Bostock, Hon. Sir Edward Cust, George Dodd, Esq., Bishop of

Norwich, Lord Seymour; *Committee of Publication*—Rev. F. W. Hope, Lieut.-Col. Sykes, N. A. Vigors, Esq., M.P., D.C.L.

BATH ROYAL HORTICULTURAL AND BOTANICAL SOCIETY.

The first show of the season took place on the 27th of May, under quite as favourable auspices as could have been expected.

WOLVERHAMPTON AND STAFFORDSHIRE HORTICULTURAL AND FLORAL SOCIETY.

This Society held its first exhibition for the present season on Tuesday last, at the Star and Garter Hotel, and, notwithstanding the ungenial spring, many fine specimens were exhibited. Those that attracted particular notice were Azalias and Panseys. The day being very unfavourable, the visitors were not numerous, but highly respectable.

SALOP HORTICULTURAL SOCIETY.

The first exhibition in 1838 took place on the 30th of April, when the prizes were awarded.

DONCASTER LYCEUM.

We regret the non-appearance of a report of this Society for 1837. Did not the report for 1836 succeed, or is the Institution going down hill? We are well-wishers of the Lyceum; and therefore we throw out the above hint, thinking that the state of the Society should be announced annually to its subscribers and the public.

BRITISH ASSOCIATION.

The Meeting will take place this year at Newcastle-Upon-Tyne, in the week commencing with the 20th of August.

CHAPTER OF MISCELLANIES.

ZOOLOGY.

Additional Locality of the Red Grous.—I omitted mentioning, in my "Catalogue of Birds found in Lancashire" (Vol. II., p. 353), that the Red Grous (*Lagopus Scoticus*) occurs not uncommonly upon Woolston Moss, near Warrington.—Peter Rylands, *Bewsey House*, *Warrington*, *May* 19, 1837.

Occurrence of *Velia rivulorum*, Jan. 5, 1838.—On Jan. 5, this year, I observed two specimens of this interesting little insect, swimming about quite briskly in a small stream here.—Henry Buist, *Law Park Cottage*, *March* 12, 1838.

The Nightingale to the North of Doncaster.—Almost all ornithological works concur in informing their readers that Doncaster forms the northern limit of the Nightingale in England. This, however, is incorrect. We have ourselves heard it near Campsall, and in a wood adjoining Owston Hall, both several miles north of Doncaster. Wm. H. Rudston Read, Esq., of Frickley Hall, in this county, informs us that several of these nocturnal choristers visit Hooton Pagnell Common; and Charles Waterton, Esq., of Walton Hall, near Wakefield, that they occur in his beautiful park every spring. It has been seen near York; and lastly, Mr. Yarrell notices its occurrence so far north as Cumberland.—Ed.

Singular Locality for the Nest of the Robin Redbreast.—A few days since, at Londsborough Park, near Market Weighton, Yorkshire, on the premises of James Matthison, Esq., there was found an old tea-kettle exposed on bare ground, and on examination it was found to be inhabited by a Robin Redbreast, with four young ones, which are all doing well.—*York Herald*, *May* 24, 1838.

In the garden of Mr. Evans, florist, of Rotherham, a Robin Redbreast built her nest in an old tin tea-kettle, in which she has laid six eggs, and young ones will undoubtedly appear in a few days, as she has been sitting more than a week. —*Sheffield Iris*, *April* 24, 1838.

Lophius piscatorius.—When walking along the Sands one day last spring, I observed a large fish lying at the mouth of a small fresh-water stream, the Swelkin-burn. Its appearance struck me so much at the time that I took a sketch of it, and afterwards, on procuring Yarrell's invaluable work on *British Fishes*, I discovered it to be the fish there named *Lophius piscatorius*, the "Sea Devil."—Henry Buist, *Law Park Cottage*, *St.Andrews*, *March* 12, 1838.

Remarks on Bats.—M. de Blainville comes to the following conclusions concerning Bats, in a memoir recently laid before the French Academy of Sciences: —1st, that they existed before the formation of the tertiary strata of northern countries, as they are found in the gypsum of the neighbourhood of Paris; 2nd, that these *Cheiroptera* were, very probably, cotemporary with *Anoplotherium* and *Palæotherium;* 3rd, that they have continued to exist from that time to the present without interruption, as they are found in the diluvium of caverns, and in osseous breccia; 4th, that the ancient *Cheiroptera* differed but little from the species now inhabiting the same countries.—*Athenæum*, *June* 2, 1838.

New Herring found on the Coast of Iceland.—Among the natural curiosities brought last summer from Iceland by Mr. Proctor, Sub-curator to the Durham University Museum, is a fish belonging to the abdominal Malacoptery-

gian order, and apparently to the family *Clupeidæ*. Mr. P. discovered this species on the northern coast, near Oifiord, in pools left by the retiring tide, his attention being excited by the Gulls which were preying on it. We have been induced to notice this fish in consequence of being unable to identify it with any of Cuvier's genera, in his *Règne Animal*. In length it varies from five to five and a half inches; the back olive brown; under parts and lateral line silvery; head compressed; jaws elongated—the under being the longer; teeth on the maxillaries and tongue, but so small as to be almost imperceptible; body more cylindrical and longer in proportion than that of the Common Herring (*Clupea harengus*); the number and position of the fins the same as in *C. harengus*, excepting that the first ventral is a little more in advance of the dorsal, and its having a slightly adipose dorsal, which clupea has not. Branchiæ, as usual, 4; brancheostegous rays 8; of the dorsal fin 13; pectoral 17; ventral 8; anal 20; caudal 20; vertebræ 69. It contained several intestina. Mr. Yarrell, in his *History of British Fishes*, alludes to a small variety of the Herring, which, according to Crantz, is found on the northern coast of Greenland, and he states that this small variety, or species, was found by Sir John Frankland on the shore of the Polar basin, on his second journey. We have never seen a specimen or a description of this Herring, but we are inclined to suppose that it is a distinct species from Mr. Proctor's, because it does not appear to be met with southward of the last-mentioned localities. Should our opinion be well founded, and Mr. P.'s fish prove to be an undescribed species, we would propose that the specific name of *Proctori* should be applied to it—a just and proper compliment to one who has been so indefatigable in the pursuit of natural science.—*Durham Advertiser*, *April* 27, 1838, *communicated by Mr. W. Proctor*.

Occurrence of *Amara ovata*.—This insect, which is stated in my "Notes on the *Amaræ*" (Vol. II., p. 240) to be rare near London, Warrington, &c., occurred rather frequently in this neighbourhood during last month, and the commencement of the present.—Peter Rylands, *Bewsey House*, *Warrington*, *May* 19, 1838.

The Scarce Swallow-tail (*Papilio podalirius*).—In the first volume of *The Naturalist*, p. 32, and also in a then recent number of Curtis's *British Entomology*, it is mentioned that a specimen of the Scarce Swallow-tail had been taken near Windsor, by W. H. R. Read, Esq., F.L.S., Z.S., E.S., O.S., &c., of Frickley Hall, near Doncaster. We have, however, seen Mr. Read on the subject, and he expresses himself not quite certain as to its being actually a British specimen. "Others have lately been *purchased* as British, by Mr. G. Robertson, Dr. Bromfield," and Mr. Allis (see *Naturalist*, *l. c.*, and Vol. II., p. 38). It would seem, then, that this beautiful and rare insect still holds a doubtful place in the British Fauna.—Ed.

Pied Wagtail's Nest on a Railway Line.—On Monday week the nest of a Pied Wagtail, containing six eggs, was discovered underneath one of the switches on the line of the Newcastle and Carlisle Railway. The bird seems not at all disturbed, but continues to sit upon its nest, and is frequently seen to go in and out of it.—*Doncaster Gazette, June* 8, 1838.

Mode of restoring Frozen Potatoes.—In consequence of some careful experiments made by himself, M. Payen recommends that frozen Potatoes should be exposed to a violent heat, in order to be perfectly dried. In this case their alimentary properties are preserved, and they may be rasped or bruised in a mortar, as food for cattle.—*Athenæum, June* 2, 1838.

New Shell allied to *Cyclostoma*.—A curious shell has been found in Bengal, which has been erected into a new genus by M. Troschet, of Berlin, under the name *Steganotoma*. It approaches the genus *Cyclostoma*, but is distinguished by the peculiar form of its aperture. Its spire is but little prominent, but consists of six whorls, separated by sutures; its lip presents a deep notch, close to the spiral part, which forms a rounded tube, touching the last whorl but one; it has an operculum, and is encircled by a brown band, spotted and striated in a zig-zag manner.—*Id.*

Pippin Crossbill (*Crucirostra cinerea*, Ryl.) in Cheshire.—A flock of Crossbills was observed last February in the neighbourhood of Tarvin, Cheshire.—Peter Rylands, *Bewsey House, Warrington, May* 12, 1838.

An Electrical Lady.—A respectable physician, in the last number of *Silliman's Journal*, gives the following curious account of an *electrical lady*. He states, that on the evening of Jan. 28, during a somewhat extraordinary display of the northern lights, the person in question became so highly charged with electricity, as to give out vivid electrical sparks from the end of each finger to the face of each of the company present. This did not cease with the heavenly phenomenon, but continued for several months, during which time she was constantly charged, and giving off electrical sparks to every conductor she approached. This was extremely vexatious, as she could not touch the stove nor any metallic utensil without first giving off an electric spark, with the consequent twinge. The state most favourable to this phenomenon was an atmosphere of about 80 Fahr., moderate exercise, and social enjoyment. It disappeared in an atmosphere approaching zero, and under the debilitating effects of fear. When seated by the stove, reading, with her feet upon the fender, she gave sparks at the rate of three or more in a minute; and under the most favourable circumstances a spark that could be seen, heard, or felt, passed every second! She could charge others in the same way, when insulated, who could then give sparks to others. To make it satisfactory that her dress did not produce it, it was changed to cotton and woollen, without altering the phenomenon. The lady

is about thirty—of sedentary pursuits, and a delicate state of health, having for two years previous suffered from acute rheumatism and neuralgic affections, with peculiar symptoms.

Cure of Cancer.—At the sitting of the Academy of Sciences, Paris, Jan. 13, 1838, MM. Baupherthuy and Adelde-Roseville addressed to the academy a detailed note on the animalculæ which are found in the contiguity of cancerous ulcers. These observations have proved the presence of animalculæ in all the cancers which they have examined. These gentlemen have sought the means which are best fitted to destroy the animalculæ, and their experiments have led them to the following results:—brandy, the tincture of iodine, concentrated solutions of the double chloride of mercury, of the chloride of gold, of arsenic, of the salts of copper, of the nitrate of silver, the laudanum of Sydenham and Rosseau, kill the animalculæ instantaneously. Solutions of the same agents, in the dose of two grains to the ounce, do not make their action felt on the animalculæ before the end of a quarter of an hour or twenty minutes, but destroy them insensibly after a space of time more or less long.—*Journal de Paris.*

Mode of Destroying Snails.—These creatures are passionately fond of bran, or the outward skin of Wheat. When this food is placed out for them they leave it as seldom as possible, and when they do retire for a time they return most eagerly again to feed on it. This suggests a mode of freeing any piece of ground of the insect. You have only to place over it little heaps of bran, pieces of broken pipes, or pots, or vessels of any kind, which may shelter the food from the rain, and your work is done. The Snails will congregate below, and you can in a short time destroy multitudes of them.—*Blackburn Gazette, June* 13, 1838.

Arcturus Sparshalli taken at Horning.—Another *Arcturus Sparshalli* was taken last year, having settled, I believe, on the outside of a boat there; it was crushed before it was noticed.—J. C. Dale, *Glanville's Wootton, Dorsetshire, July* 9, 1837.

The Snow Bunting (*Plectrophanes nivalis*) occurs near this town in its varied plumage.—Patrick Hawkridge, *Scarborough, Aug.* 7, 1837.

Osprey shot near Bury.—A few days since, Mr. Thomas Bridge, farmer, Pilsworth, near Bury, shot an Osprey or Sea-eagle in a field near his own house. Its expanded wings measure five feet seven inches, and from head to tail one foot ten inches. It is a male bird, and had in its crop a fish weighing six and a half ounces. It is now being stuffed at Mr. Robert Turner's, top of Hebers, Middleton.—*York Herald, May* 26, 1838.

New Birds.—Three new genera of birds, hitherto entirely unknown to science, have been sent from Madagascar by M. Bernier, to the Museum of Natural History in Paris. M. Isidore Geoffroy Saint-Hilaire has named them *Philepitta, Oriolia*, and *Mesites.* The latter is the most curious, as it bears affinity

to Pigeons by its feet, to the Gallinaceous birds by its wings, and by its beak and nostrils approaches a genus of *Palmipedes*. *Philepitta* belongs to the *Passeres*, and bears the specific name of *sericea ; Oriolia Bernieri* to the *Orioli* among the *Passeres ;* and *Mesites* will probably form the type of an entirely new family.—*Athenæum, May* 26, 1838.

Scientific Expedition.—We have frequently had to report the progress of the *Bonite* during her voyage round the world, in order to take out the consular agents of France to different colonies. The following is a brief summary of the scientific labours of the officers on board. The voyage was completed in 631 days, during which the corvette only anchored 151 days; it has therefore been a matter of surprise that so much should have been done for Zoology, for among a considerable collection of rarities five have been added which form types of new genera, and of which there was either no vestige in museums, or only imperfect specimens; and besides these there are many new species. Among the fishes are several which tend to confirm the truth of Chinese drawings, in many instances reckoned fabulous. The class of insects has been equally enriched, and particular attention has been paid to those orders which have been hitherto neglected. The *Arachnidœ* and *Crustacea* have received important augmentations; the numerous drawings of *Mollusca*, extending even to the microscopic orders, prove that in the open sea there has been equal activity; and 4,000 observations on the temperature of the human body attest the fact that it rises and falls with that of the atmosphere. The phosphorescence of the sea has been an object of continual research, and the organized beings which cause it have been carefully preserved in spirits-of-wine. To all this wealth in Natural History may be added a portfolio of more than 200 drawings, and numerous accurate descriptions. With respect to Physics, observations with the barometer, thermometer, and other instruments, have been made at every hour of the day and night. Seven experiments made with the apparatus of M. Biot, to ascertain the composition of sea-water at a great depth, have produced some unexpected results; and among other things, Terrestrial Magnetism has been carefully studied. M. Gaudichaud has been equally indefatigable with respect to Botany, and has brought back an immense collection of woods, plants, fruits, seeds, drawings and notes. A Tree-fern, *Cyathea arborea*, from which some of the pieces of the trunk were taken, measured 40 feet, and was not the largest which M. Gaudichaud observed in Bourbon. He has sown several seeds, and has also brought three young plants of the Dragon-tree (*Dracœna draco*), three of the Chili Balm (*Cocos Molinii*), besides several other palms.—*Id.*

BOTANY.

Effects of the Winter of 1838 on Vegetation.—The late severe weather has

made sad havock among evergreens. The greater portion are quite killed. None have suffered so much as the Laurestine (*Viburnum tinus*). I believe scarcely a plant has escaped in this neighbourhood. Most of the Laurels have suffered dreadfully, and even the Holly has felt the effects of the frost. Many of our fine plants are almost denuded of their leaves. The Common Furze in exposed situations is yet quite black, with scarcely a flower or a bud to be seen, whilst its more humble companion, *Ulex nanus*, has not suffered in the least, and has already put forth its beautiful blossoms, the two species exhibiting a great contrast.—J. D. Salmon, *Godalming, Surrey, April* 16, 1838.—[In many instances where irreparable injury is supposed to have been inflicted on plants by frost, we take the effect to be temporary rather than permanent. This, *e. g.*, is the case with the Common Furze (*Ulex Europæus*), mentioned by Mr. Salmon. In this neighbourhood these plants are even now (June 13), mostly bare of leaves and flowers; but they everywhere display indisputable testimony of returning vitality. We would recommend caution in casting away shrubs apparently killed by the frost. It is always as well to wait till May or June before they are rejected. —Ed.]

Effect of Carbonic Acid on Vegetation.—At p. 330 of this Journal, "it is stated by M. Traviranus that vegetation is not so active near springs where carbonic acid is disengaged." In inserting this extract from *The Athenæum*, we had then no space for commenting on the above assertion. But surely the learned author of *Physiologie Végétale* cannot be unacquainted with the fact, admitted by all the best vegetable physiologists, that plants not only flourish in soil containing carbonic acid, but cannot become vigorous without it, and that they are healthy in direct proportion to the abundance of carbonic acid existing in the growing medium. In fact it is clearly demonstrable that the most valuable manures are those which yield carbonic acid most steadily and abundantly.—Ed.

REVIEWS OF NEW PUBLICATIONS.

The Wonders of Geology; or, a familiar Exposition of Geological Phenomena; being the Substance of a Course of Lectures delivered at Brighton. By Gideon Mantell, LL.D., F.R.S., &c. &c. &c. From Notes taken by G. F. Richardson, Curator of the Mantellian Museum, &c. London: *Relfe and Fletcher*, Cornhill, 1838. Two Vols., post 8vo.

The name of Dr. Mantell is not new to our readers. On the contrary, he has long been familiar to the scientific world for his geological discoveries, his works, and his extensive collection, generally known as the Mantellian Museum.

But for the zeal of the editor, Mr. Richardson, perhaps the work before us would never have been published. Wherefore, although he merely claims to have strung together the pearls which lay before him, we certainly owe him no small debt of gratitude.

We shall not attempt any abstract, however brief, of these volumes. Independently of the impossibility of effecting this in the few pages which can be devoted to the review, such abstracts are too apt, from their very nature, to be unfair to the author and unsatisfactory to the reader. Our remarks will, therefore, be critical, or confined to the notice of strikingly interesting circumstances.

Our author opens his first lecture by premising, that Fossil Comparative Anatomy has, for many years, formed his principal relaxation from an extensive medical practice, during which period he formed the collection now celebrated among the savans of every civilized land. This collection was thrown open for the gratuitous admission of the public. The necessity at length foreseen of closing the museum, led to the establishment of the Sussex Royal Institution. For the benefit of this Society, the doctor delivered the course of lectures now offered to the public. "And permit me to observe," says he, "that my career as a lecturer will begin and end in Brighton; for at the termination of this session, should Providence allot me life and health, I shall remove to a less public, but not less important sphere of usefulness."

That in the whole range of the sciences there is not one more interesting, or more wonderful in its disclosures than Geology, we fully agree with Dr. Mantell. A study which can, as it were, bring past ages before our ravished view, and give importance and meaning to every pebble and grain of sand we meet with, is not to be despised. All this is effected by Geology. But it has done much more. By proving that Moses did not know *quite* as much of the earth as Dr. Buckland—that he did not *exactly* teach all that was required respecting our globe—and that he was not altogether so accurate as a Mantell, a Sedgwick, or a Lyell, and testifying that the Scriptures do not call for that indiscriminate faith and reliance once demanded in their behalf, it has contributed not a little to the advancement of free inquiry. A hundred years ago, a man who should openly have declared his disbelief in the first chapter of Genesis, and have rendered reasons for so doing, would have been deemed mad—if indeed he escaped a more severe punishment for his heresy. As science has progressed, the divines, as a body, have uniformly opposed its conclusions so far as they were in contradiction to the Bible—alarmed, it would seem, lest science might convince them of the truth, that the Bible may err as well as any other human work! The learned, however, were desirous of effecting an impossibility—or an absurdity, if possible—viz. reconciling the unerring results of modern investigation with the attempted scientific records of an individual altogether a stranger to scientific

investigation. These, again, have given way to other men of science, who study the undoubted works of God without traditionary assistance. They, too, have occasionally attempted so to twist the scriptural records as to suit their own scientific views. The attempt has proved a gross failure; but even supposing a more specious case to have been made out, we cannot but arrive at the following conclusions respecting the Bible so far as science is concerned:—That without science, the Bible is valueless, because its truth must be tested by natural-theological testimony; and that when we *have* the aid of science, the Bible is superfluous—superfluous if true, because incomplete, and unimprovable; and absolutely pernicious if not true. We are glad to find that a nearly similar view has been taken by the Rev. Professor POWELL, of Oxford. Out of the question of Scripture and Geology Dr. MANTELL has crept in a very easy, and, we must confess, most ingenious manner. Probably alarmed at the idea of discussing the point before a fashionable audience in Brighton, he has "contented himself" with an abstract from a sermon by the Bishop of LONDON! Such a course may please the worthy prelate alluded to, but whether it will satisfy an enlightened public must be considered very doubtful. *

We have before explained the geological arrangement of the strata; but as this is the basis of the science, and ought to be kept distinctly in view, we shall here repeat it, with a few additional observations. The *primary rocks* are crystalline, and consequently it is inferred, that they owe their origin solely to igneous agency. They consist of lavas of various ages,—granite, sienite, porphyry, &c. They are the lowermost rocks, and contain no organic remains.—The *transition rocks* are superimposed upon the preceding, and are more or less distinctly stratified, being, in fact, strata modified by the combined effects of great heat and high pressure. They contain remains of Corals, shells, plants, &c.—Above these lie the *secondary rocks*, formed from the destruction of the more ancient beds—not, like them, by igneous agency, but being subaqueous deposits in hollows and depressions. They accordingly originally lay in horizontal layers or "strata," but have since for the most part been more or less dislodged by various means.

* We may here observe, that both before and after the publication of *The Naturalist* for June, we were duly warned that our remarks on this topic would injure the sale of the Journal. We could only reply, that we had a better opinion of the good sense of our readers than to believe, *à priori*, that they would object to any discussion instituted with the view of advancing the great cause of truth; that if they did object to it, it would but prove the more forcibly the necessity of such inquiries; and, lastly, to advert to an entirely minor consideration, that the more subscribers we lost, the greater the honour for us. We leave it to those who can reconcile such a course with their consciences, to repress or distort truth with the view of obtaining a circulation. But, in justice alike to the public and to ourselves, let us state, that half a hundred more copies were sold of the June than of any other number. The advice of our kind friends was, therefore, a little misplaced.

They abound in fossil remains, which ascend from the ancient zoophytes and plants in the lower strata to the gigantic and long-since extinct reptiles in the upper, viz. the chalk.—The *tertiary rocks*—which, like the preceding, consist of subaqueous deposits from the detritus of ancient formations—lie in the basins of the chalk-beds. "They abound in shells, plants, zoophytes, Crustacea, &c.; and in them, with but one exception, the bones of Mammalia first appear."—Lastly, the *supra-tertiary strata* form the surface of the country, consisting of alluvial or water-worn matter. Here again we find the fossil remains of extinct animals, but likewise, in addition, those of existing species.

In a former article we adverted to the theory, that the world was originally filled with gas—an hypothesis supported by "Sir John Herschel, Bart.," and other astronomers. Thus some of the heavenly bodies are mere clouds of attenuated light, while others are curdling into separate masses, and others again present an appearance more nearly resembling the structure of our own globe; and every variety exists between the states to which we have alluded.

It has been argued, from the presence of tropical vegetation in British rocks, that our country must once have possessed a tropical climate; and although the existence of streams whose regular office it is to convey the products of tropical climes to temperate regions, may well serve as a caution against rash and hasty conclusions, we think the existence of tropical vegetation in this island in all probability *not* thus drifted, seems strongly in favour of the theory—now tolerably certain—that districts in our day temperate have in past cycles experienced the ardour of a tropical sun.

At p. 66, Dr. MANTELL describes the singular and highly interesting discovery —first announced in the *American Journal of Science*, in 1822—of two perfect impressions of human feet in Sandstone, observed in a quarry at St. Louis, on the western bank of the Mississippi. They were at first supposed to have been carved in the stone by the Indians; but the anatomical accuracy of the impressions, which, it is said, would have done honour to the chisel of a CHANTREY, is strongly opposed to this conclusion. They are of average size, and in the position of the feet of a man standing "at ease." "No doubt exists in my mind," observes our author, "that these are the actual prints of human feet in soft sand, which was quickly converted into solid rock by the infiltration of calcareous matter." Without the slightest desire of invalidating this argument, we may mention the difficulty involved in these being the only two impressions. If they were actually unique, and unless the man who has thus unwittingly excited the interest of posterity, possessed wings, how did it happen that no other prints were discovered? Dr. MANTELL, however, promises us further enlightenment on the point at a future opportunity.

Those interesting phenomena the geysers of Iceland are alluded to in a subse-

quent paragraph. They are intermittent thermal springs. First, water is thrown up from the volcanic bowels of the earth to a great height; and when the fluid is exhausted, steam continues to ascend for some time. The well-known phrenologist, Sir G. STUART MACKENZIE, Bart., has propounded a highly ingenious and probable explanation of these gushing fountains. Iceland may be considered almost exclusively one mass of volcanic matter. Now water percolating from the surface of the earth through various crevices, is quickly converted into steam by the burning lava below. Heated steam, rising from beneath the basin of water in the rock, becomes partially condensed; water filling the lower part of the cavity attains the boiling temperature, while steam under high pressure occupies the upper portion of the chasm. The expansive power of the steam rises until it propels the water through a fissure or pipe in the rock, and a great distance through the open air. When the water is exhausted the steam escapes, as previously explained.

In a former number we stated that horizontal sedimentary strata have frequently been raised into mountains by sudden volcanic eruptions; but it has been shown, by means of the pyrometer, that the central heat of the earth acts in another way to produce the same effect. The expansion of a bar of metal by heat, and its subsequent contraction on cooling, are facts familiar to the chemist; and Col. TOTTEN has proved, by careful experiments on granite, marble, &c., that the expansion or contraction of large masses of these substances from variations of temperature, would account for the elevation and subsidence of extensive tracts of country (p. 81). An interesting and remarkable instance of this, apparently resulting from the above-mentioned cause, is afforded by the celebrated remains of the temple of JUPITER SERAPIS, at Puteoli, an engraving of which, from LYELL'S *Principles of Geology*, is supplied by Dr. MANTELL. Such changes, it appears, have been taking place from the earliest ages, and are still in operation in our times. Thus the tract of country in Scandinavia, lying between Frederickshal, in Sweden, and Abo, in Finland, or even further, is slowly and visibly rising; while on the other hand, the adjacent coast of Greenland is gradually sinking.—This fact was noticed long ago by CELSIUS, and has recently been confirmed by Mr. LYELL. Here, observes Dr. MANTELL, is "an instance in which the elevation of a country, with the whole burden of its people and its cities, is actually taking place, unheeded by the busy multitude, and known only by the researches of the natural philosopher!" —p 92.

Further on, the singular circumstance is noticed of entire animals, bones, flesh, and skin, having been found in frozen gravel and in ice-bergs.

"In 1774, near Vilhoui, the carcase of a Rhinoceros was taken from the frozen sand, where it must have been concealed for ages, the soil of that region being always frozen to within a few inches of the surface. The carcase was a complete natural mummy, part of the skin being still covered with long hairs, and forming a warmer covering than that of the African Rhinoceros.—

The discovery of a Mammoth, under similar circumstances, is still more interesting. Towards the close of last century, a Tungusian fisherman observed, in a cliff of ice and gravel, on the banks of the Lena, a shapeless mass, the nature of which he was unable to determine. In the course of next year it was more visible, and on the third, a large tusk was seen projecting from the ice-cliff, and at length became detached. On the fifth year an early thaw set in, and the entire carcase of a Mammoth was exposed, and at length fell upon the ground. It was nine feet high, and about sixteen feet in length; the tusks were nine feet long. The flesh was in such a state of preservation, that it was devoured, as it lay, by Wolves and Bears, and the hunters fed their Dogs with the remains. The skin was covered with hair, consisting of black bristles, thicker than horse hair, and fifteen inches in length; wool of a reddish brown, and hair of a fawn-color, and with a mane on the neck. Upwards of 30lbs. of hair were collected, and specimens of it are preserved in the Hunterian Museum. The ear remained dry and shrivelled; the brain, and even the capsule of the eye were preserved! the bones and part of the integuments, and a considerable quantity of the hair, are in the Museum of Natural History at St. Petersburg."—p. 126.

All cold-water springs proceed from subterraneous rivers which have forced their way to the surface; but thermal springs and geysers are supposed to originate in the manner already explained. It is in general only a branch of the river that ascends from its gloomy repositories, where it has continued to flow, calmly or rapidly, from day to day, from year to year, and from age to age, and where it may yet pursue its darkling course for cycles innumerable.

The curious tribe of Foraminiforous animals is briefly alluded to at a subsequent page, and the *internal*, coin-like, shell of these animals explained. The use of this internal shell was doubtless to form a support for the soft part of the animal, and was used as a buoy, by which means the proprietor could sink or swim at pleasure.

From the immense numbers of fossil fish, of different species, found in Monte Bolca, on the Venetian frontier, and from the volcanic nature of the district, it is supposed that the Limestone in which they were imbedded was erupted into the sea by volcanic agency; and that the calcareous matter which suffocated the fishes, afterwards surrounded them with a solid crust. Hundreds of species and thousands of specimens have already been discovered. They all belong to extinct kinds. The above hypothesis is by no means unsupported by modern observations; for, only a few years ago, the appearance of a volcanic island in the Mediterranean quickly caused the death of multitudes of the finny tribes in that sea; hundreds were seen dead and putrid, floating on the surface of the water (p. 235).

In another part allusion is made to the gigantic *Mosæsaurus* of Maëstricht, in Limburg, originally secured by M. Hoffman, on the grounds belonging to the Canon of the Cathedral. M. H. had actually borne the precious relic home, when the Canon, by a tedious and expensive law-suit, succeeded in regaining the fossil. Some years afterwards, in the French Revolution, the armies of the Republic advanced to the gates of Maëstricht; the town was besieged; but, by desire of the savans who accompanied the troops, the artillery was ordered to refrain from

damaging the part of the city where the specimen was known to be deposited. The Canon, suspecting the cause of this favor, secreted his treasure in a vault; but when the city was taken, the French authorities compelled him to surrender his prize, which was conveyed to the *Jardin des Plantes*, at Paris, where it still remains. Whatever may be thought of the Canon, we cannot but consider that he had a perfect right to this celebrated fossil; and that he, and not M. HOFFMANN, was unfairly treated. Dr. MANTELL appears to be of a different opinion.

Professor EHRENBERG, of microscopic celebrity, computes that the Tripoli of Bilin, in Bohemia, consists almost exclusively of the silicious remains of *Infusoria*, of a species so minute, that a cubic inch of stone, weighing 220 grs., contains upwards of 41,000,000 of these skeletons! (p. 300.) The Purbeck Limestone of the Wealden abounds in organic remains; and the marble is a conglomerate of small fresh-water Snail-shells (*Paludina*), &c. "How interesting," exclaims our author (p. 331), "is the reflection, that the beautiful cluster columns, the richest ornaments of Chichester Cathedral, are entirely composed of the shelly coverings of Snails, which lived in the river of a country inhabited by colossal reptiles!"

The teeth of the Crocodile, as represented at p. 352, consist of several imbricated cones; and when the outer tooth wears away, a new one supplies its place. The patriarchs of the race are, therefore, just as well off in this respect as the youngsters. Unfortunately for the majority of our own species, but happily for the individuals ycleped dentists, no such provision exists in Man!

The discovery of some bones of the Iguanodon, by our correspondent, Mr. W. H. BENSTED, is subsequently detailed. They were found in a stone-quarry belonging to that gentleman, near Maidstone, and were mistaken by the workmen for petrified wood.

Dr. MANTELL's sketch of the Wealden, that interesting fresh-water deposit lying on marine formations, is masterly; but we have no room for enlarging upon the subject to any advantage.

We have now cursorily glanced at a few of the wonders contained in the four first lectures, as published in Vol. I., and shall conclude with a few general observations on the plan of the work. The volumes are liberally illustrated with "neat wood-cuts." The method adopted of furnishing what are technically termed "side-headings" to the paragraphs where a new branch of the subject commences, and of numbering these paragraphs, is excellent; and we must especially applaud the plan of supplying a glossary of scientific terms at the end of the volume. In short, nothing can be more complete than the editorial "getting-up" of the work, the credit of which, we presume, is due to Mr. RICHARDSON.

Dr. MANTELL has very appropriately termed his work the *Wonders of Geology*.

It is replete with interesting matter, and contains much that may instruct even the experienced geologist. If we are to notice the second volume—which it will give us pleasure to do, if practicable,—it must be in a future number. The book is inscribed to the Earl of MUNSTER.

Molluscous Animals, including Shell-fish; containing an Exposition of their Structure, Systematical Arrangement, Physical Distribution, and Dietetical Uses, with a Reference to the Extinct Races. Forming the Article "Mollusca" in the Seventh Edition of the *Encyclopædia Britannica.* By JOHN FLEMING, D.D., F.R.S.E., M.W.S., &c. &c. &c. Edinburgh: *Adam and Charles Black.* 1837. 8vo. pp. 246.

THE study of part of the subject treated of by Dr. FLEMING has long formed a popular amusement. What! exclaims the reader, those Snails and other "nasty creatures" to which ladies at least must surely object. No: not these, but their calcareous coverings, called shells. Molluscous animals have been divided into two classes: those with shells, and those which are destitute of such appendages. The study of the former has been termed Conchology, that of the latter Molluscology. Thus persons who would turn from the naked *Mollusca* with disgust, collect with enthusiasm all the marine and fluviatile shells they can meet with, and view with rapture or complacency their burnished surfaces in the museum. Who can fail to admire the gaudy or lovely hues of certain shells which vie in splendour with the feathered and vegetable gems of tropical climes, or with the precious stones so prized in every land? Where is the man of taste who can notice and not admire the elegant forms of others, and the almost endlessly-diversified shapes presented by these singular domiciles, and the variety of purposes to which they are adapted? But the mere collector or admirer who flatters himself that he is a *naturalist*, grossly deceives himself. The pursuit, however, is innocent and pleasing in itself, and therefore useful; and it may lead to something better. It has, further, this advantage, that rare shells are thereby occasionally obtained which might otherwise have remained unnoticed. But beauty, rather than rarity, is the principle aim of all such collectors, and science can scarcely be said to benefit from their exertions. Dr. FLEMING very judiciously unites the shelled and the shell-less animals under his class *Mollusca*, and writes with no view of presenting the reader with a conchologist's *vade mecum*. Such books may already be procured in abundance.

Molluscous animals are divided, according to their haunts, into three groups, termed terrestrial, fluviatile, and marine. The *land mollusca* belong exclusively to the order *Gasteropoda*, as Snails, &c.; some frequenting open pastures, others preferring the rubbish of old walls, while many reside in woods and among

decayed leaves.—The *fluviatile Mollusca*, including many *Gasteropoda*, and some *Conchifera*, reside in fresh waters. Some frequent shallow ponds, breathe by means of a pulmonary cavity, and come to the surface to respire. Others reside in waters of different depths, since they respire by gills, and are less dependent on the shallowness of the water.—*Marine Mollusca* include genera of all the classes. Some, termed littoral, burrow in the sand, or adhere to the rocks between high and low water mark. Others, named pelagic, dwell in the deep, and are only obtained by diving and dredging, or by storms which cast them on shore. (p. 20.) All the terrestrial conchiferous animals have the power of passing into torpidity, or at least they do frequently enter this state, independently of temperature. This is the case with the common Garden Snail (*Helix nemoralis*), when placed in a box without food in midsummer; in a day or two they attach themselves to the side of their prison, and become torpid, in which state they will remain for years if undisturbed. The temperature does not act in this case as with hybernating animals; indeed it is in the hottest weather that, in their natural state, they most frequently assume the condition alluded to. This circumstance, and the fact that the Snail speedily revives if plunged into water, or even slightly moistened, leads us to the conclusion that its cause must be sought in the unnatural absorption of fluid from the body in long-continued drought. A caged Snail kept in succulent herbage would in all probability retain the full use of its powers.

In the second chapter Dr. Fleming treats of the progress of Molluscology, of the various systems propounded by early and recent authors, and of the importance of the characters on which they are severally founded. No one conversant with the most celebrated classifications in the different branches of Natural Science, or who reflects upon the subject, can doubt that the only way of arriving at anything like a natural or rational system, is to take into consideration every part of the animal, whether external or internal. Those who have fixed upon any one artificial character (Linnæus, Vieillot, &c., for example) have frequently framed very useful and ingenious arrangements; but these are never to be compared, for accuracy, with the "natural systems." The case is strikingly analogous to the celebrated physiognomical system of Lavater. This philosopher, instead of estimating the moral and intellectual character of Man from the development of the brain, the fountain-head, selected the features of the face as his index. Now such a mode is productive of some advantage, inasmuch as the cerebral development exercises a certain influence over the muscles of the face; but, for obvious reasons, errors must abound even respecting the few predications which can be made; while the development of the encephalon* affords

* Εν, in, and κεφαλη, the head, a scientific term employed for the brain; used by some, improperly, for the cerebrum only.

an unfailing test of mental power. Even so it is with zoological systems. One part depends upon another; and therefore even a subordinate part might form a character for an artificial system; but many absurdities would be involved in carrying it out; while by attention to the most important characters, or to the whole combined, comparatively little difficulty would be experienced, and the result would be a far more perfect arrangement. In Molluscology, however, as in other branches of Zoology, we are not always allowed our choice in this respect, for many species of shells, both recent and fossil, are never found with the animals which once resided in them. The naturalist must, therefore, be fully prepared to classify much of his material with more scanty data than he would desire. Systems have been formed from the consideration of the *habits* of mollusca, of their external or internal plates, called *shells*, from the *inhabiting animals*, and from the combination of these characters.

The genus *Bulla* of LINNÆUS, with a few of his *Murices*, constitute the generic group *Pyrula* of LAMARK. Now this latter name is familiar to our readers as a genus in Ornithology. In instituting new names, care should be taken that the appellation is not already occupied in any branch of Zoology. In the present case perhaps it may not be worth while to alter the name; but the Coalhood's scientific designation might be spelled as at present, *Pyrhula* (which we take to be the proper method), and LAMARK's genus might also remain *Pyrula*. The distinction, it is true, is slight; and naturalists are not always careful in correcting their proofs; but it appears to us the smaller of two evils. And here, as we have entered upon the subject, let us notice another circumstance, which, though not of first-rate importance, yet, as it is often overlooked, may as well be alluded to. It is the plan of prefixing the article to Latin names, as "the *Clio Borealis*," "the *Helix pellucida*," &c. In Latin the substantive includes the article; and therefore "the *Argonauta Arctica*" is just as absurd as "the *l'Aigle tacheté*," "the *l'Aquila commune*," "the *die Sperber*," or "*die* the Sparrow Hawk," in French, Italian, and German. Want of attention to this gives a slovenly air to a scientific work. Nor ought we to pass in silence the typographical errors which disfigure this volume; the odium of which may probably be divided between the Rev. Dr. FLEMING and the "Printer's Devil."

At the conclusion of his retrospect of molluscological systems, our author observes, that the reader, perhaps, is astonished at the changes which have taken place since the arrangement of LINNÆUS reigned paramount; and adds, very justly, that the Linnæan genera, though in general sufficiently numerous and commodious to embrace all the then known species, are perfectly inadequate to contain the greatly-increased number now familiar to the naturalist. The implicit followers of LINNÆUS, in still retaining his genera, without the necessary additions, act in a manner which their great master, if now alive, would certainly

not sanction. The same remark applies, more or less, to other departments of Zoology.

We do not think, with our author (p. 122), that the abundant distribution of nerves in molluscous animals, sufficiently proves these animals to possess a considerable degree of sensibility, but rather the contrary; for besides the (so to speak) lymphatic nature of the brain in these animals, the very diffused character of the nerves that do exist, rather tends to point out an inferior degree of sensibility. On comparison of Mollusca with creatures somewhat above them in the scale, our remark will find ample confirmation.

In the genus *Aplysia* a purple fluid is secreted under the free side of the dorsal plate, in a spongy tissue, by a gland connected with the cellular reservoir. This gland is supplied by a large branch of the glandular aorta, and sends out two veins to the left vena cava. The fluid has never undergone careful investigation. It is readily ejected in fresh water, and often stains the nets of unsuspecting fishermen to a considerable extent, especially when the animal is squeezed in the meshes.

The third chapter descants on the uses of molluscous animals. This is a very engaging portion of the volume, especially to the gourmand; but space forbids us to enter upon its details. Here, however, are laid forth the excellencies of various shell-fish well known to "the amateur," in the shape of stews, soups, sauces, &c. &c.; the good qualities of some little creatures at present abandoned to the *profanum vulgus;* and we learn how animals now unheeded by the epicure might, on trial, and with the assistance of the art of cookery, and other "aids to digestion," be found highly palatable and wholesome.—Dyes are likewise obtained from Mollusca —black, purple, red, &c. The brown tint obtained from the Cuttle-fish (*Sepia*) is familiar to every one. Pearls are furnished by the same class of animals, as likewise is a kind of thread used in the manufacture of garments. Dr. FLEMING also includes among the "uses" the amusement afforded to collectors in procuring and preparing shells for the museum—and rightly, in our opinion.

Here, then, we draw to a close. We are much pleased with the manner in which our author—a veteran in science—has performed his task. The illustrative wood-cuts will prove a considerable assistance to the student, though certainly shells do not appear to advantage in this kind of engraving.

LITERARY INTELLIGENCE.

A NEW edition of Dr. BEVAN'S *Honey Bee* has just appeared. Critical notices of this work, of Professor POWELL'S masterly work, of Mr. WILSON'S *Treatise on Insects*, and a whole host of other new publications, received for review, are unavoidably postponed. A desire to bestow more attention on some of these volumes, and a pressure of matter, will amply demonstrate the propriety of such a procedure.

THE NATURALIST.

VOL. III., NO. XXIV.—SEPTEMBER, 1838.

EFFECT OF THE WINTER OF 1838 ON VEGETATION IN THE NEIGHBOURHOOD OF THAMES DITTON, SURREY.

By Hewett Cottrell Watson, Esq., F.L.S., &c.
Editor of the *Phrenological Journal*.

In *The Naturalist* for May last (p. 241) are some observations on the lowest temperature of January, 1838. During one night of twelve hours, following the 19th day, the thermometer indicated a temperature below zero of Fahrenheit, the lowest point observed being eight degrees below zero, that is, forty degrees below the freezing point. On the morning of the 15th it had been as low as five degrees above zero. The ground being thinly covered with snow, and these very low temperatures enduring only for a few hours, the roots of plants must have been in a much higher temperature; but the soil was hard frozen to the depth of half-a-yard and more, unless in places where dead leaves or other covering formed a protection. On the 22nd the thaw was rapid on the surface of the ground, the sun shining brightly, and the thermometer rising to forty-six. Much of the snow melted, and the water remained on the ground, the ice underneath preventing it sinking into the earth. On the night of the 23rd, the frost again set in, but the thermometer here did not sink below nineteen degrees after the 20th of January. On the 29th we had the thermometer at forty-seven and a half, and on the 8th of February as high as fifty; frost again following these high temperatures. I mention these particulars, in the supposition that much of the injury to vegetation was owing to the rapid and temporary thaws of the surface of the ground. In time, we shall probably have many reports published, showing the effects of the cold, in its different degrees of intensity, in various places. If these reports are collected together, much valuable information may be obtained, for the purposes of the botanical geographer, the vegetable physiologist, and the practical gardener. In offering my quota, I shall limit my observations chiefly to plants (particularly evergreen shrubs) in my own garden; because continued observation was necessary to judge accurately of the extent of injury to several species; some not exhibiting signs of life until midsummer; others lingering alive for

months, and then dying. I can scarcely say that any evergreen tree or shrub escaped injury altogether, though some few species suffered very little. Perhaps the more convenient method of stating the extent of injury to different species will be to group them in accordance with it.

1. *Killed.—Fuchsia globosa, Fuchsia coccinea, Calceolaria integrifolia, Cistus ladaniferus, Reseda fruticulosa, Malcomia maritima*, the latter of various growth, from the smallest seedlings up to plants in bud. *Ixia crocata*, Common Myrtles of two years growth, raised from seeds, and several species of *Mesembryanthemum*, all under hand-glasses, with the protection of a few dry leaves. These were all killed; and the Cauliflowers, young and old, shared the same fate; as did also every root of Celery.

2. *Not wholly destroyed.*—The Common Laurestinus suffered greatly, a few shrubs died, and out of nearly a hundred not one of them had a stem left alive above ground; but nine-tenths shot vigorous suckers from the root early in spring. Of *Erica Mediterranea* and *Erica Australis*, old plants were completely killed; one young specimen of each of these Heaths had about an inch of the lower part of the stem above ground left alive, which shot young branches; but the stem of *E. Mediterranea* being split, the branches died away in June. Almost all the Common Stocks and Wall-flowers, except very young plants, were killed; Vines in pots, of one and two summers' growth, were all injured in the wood, and some of them killed; the pots were half sunk in the ground. I think these Vines died from the root upwards. Of Broccoli only five per cent. survived. The rest of the Cabbage tribe escaped better, but several plants of the different varieties died immediately after the frost ceased. Half the Turnips were killed; the roots of the Garden Turnip, the leaves of the Swedish, suffering most.

3. *Destroyed, excepting the roots or main-stems.*—This was the fate of most of the evergreen shrubs. Many of them were killed to the surface of the ground, only the subterranean portions remaining alive. Others were killed nearly to the ground; but healthy and strong shoots broke from the lower part of the stems, a few inches above the soil. A few plants were killed entirely. These different degrees of injury were seen in shrubs of the same species. Amongst those injured in this way we may enumerate the Common Laurel, Common Strawberry-tree, evergreen Oaks, Phillyreas, Common Myrtle (raised by cuttings and under a hand-glass), Common Bay, Common Lavender, Rosemary, *Vaccinium arctostaphylos, Aucuba Japonica*, several Roses (monthly, China, and noisettes), *Tussilago fragrans, Tamarix Gallica, Cytisus albus, Spartium scoparium, Ulex Europæus.* Two kinds of Fuchsia, namely, *Fuchsia conica*, and another, probably a seedling variety, survived, though all the branches above ground were destroyed, as usual. Out of about three hundred Laurels, only four retained any leaves alive till April.

These were layers of the preceding summer, transplanted in autumn. The leaves were not destroyed on a few branches cut off before the frost, and left lying upon the ground. The Laurels died from within outwards, the bark remaining green and fresh after the wood became brown inside. Many produced young leaves in April, but all died away as the weather became warm, with one exception, in a shrub of four years old, transplanted the preceding autumn, the stem of which remained alive for two feet above the ground, and grew vigorously. The hardy Heaths, as *Erica multiflora*, *E. vagans*, *E. ciliaris*, *E. stricta*, suffered remarkably. I do not think the cold destroyed vitality in their stems at once; but they were split into fibrous cordage, bearing some resemblance to a rope untwisted by use, or maceration in water. The same thing happened with *E. Australis* and *E. Mediterranea*, their leaves and shoots being also seared, and turning brown and brittle in the sun; whilst those of the species before mentioned remained green, and apparently alive, for some weeks, many of their lower branches escaping with little injury, and growing well in the following summer.

4. *Leaves and young wood destroyed; the larger branches and stems more or less injured.*—The Portugal Laurel, *Daphne laureola*, variegated Holly, *Euphorbia amygdaloides*, *Kalmia glauca*, *Corchorus Japonicus*, *Pæonia Moutan*, *Hypericum androsæmam*, *Helianthemum vulgare*, Common Southernwood, Irish Ivy, Common Broom, Sage, White and Yellow Jasmines, and white variety of *Pyrus Japonica*, come under this head.

5. *Leaves, buds, or young wood partially destroyed.*—Common Ivy, *Andromeda polifolia*, *Azalea nudiflora*, *Lyonia racemosa*, *Erica cinerea*, Common Holly, and *Thuja Orientalis* may be named as examples of this amount of injury; some of the smaller branches or twigs dying. The flower-buds of the common Rhododendrons, *Azalea Pontica*, *Pyrus Japonica*, and *Corchorus Japonicus* were mostly destroyed; a few of the middle flowers of the umbels escaping in some of the buds of the Rhododendrons and *Azalea Pontica*, and expanding late in the spring.

6. *Scarcely injured, in foliage or branches.*—*Juniperus Virginiana*, *Thuja Occidentalis*, *Erica tetralix*, *Kalmia latifolia*, *Kalmia angustifolia*, *Ledum latifolium*, and the commoner species of *Pinus*. Young Peas, just through the ground, escaped injury, being covered with snow.

It may be worth while to mention, that many Potatoes, accidentally left in the ground, survived and sprouted. The same occurred with two Dahlias. One Spanish Chesnut died, but it was previously in an unhealthy condition. The same may be said of a *Magnolia purpurea*. Much of the young wood of the Walnut was killed. Vines against the house escaped injury; but much of the young wood of those against a wooden paling was destroyed. Artichokes were almost killed, but a few feeble suckers appeared in June, from about one-third

of the roots. Many weeds were destroyed, such as usually survive the winter as young plants, springing from seed late in the autumn. *Papaver rhœas* and *Fumaria officinalis* are examples of this. The leaves of the Common Parsley were killed; those of Common and Lemon-scented Thyme mostly escaped, excepting where the snow thawed by day and froze upon them at night. *Cactus opuntia*, under a hand-glass, escaped serious injury.

In a general way, these remarks will apply to a tract of country extending along the banks of the Thames, from Kingston to Walton, constituting a level plain of about six miles long, and varying from a quarter of a mile to two miles in width, on the Surrey side of the Thames. This plain is probably not more than twenty to fifty feet (according to situation) above the highest tides of the Thames. To the south of it, the surface rises in undulations, gradually becoming higher until we reach the Chalk hills some ten or twelve miles distant. In whatever direction we quit this plain, and ascend the low hills which bound it, the injury to vegetation is found much less. At a hundred feet of elevation, the Laurels escaped with slight injury; but the Bays and Laurestinuses were cut down. In the sheltered gardens of Hampton Court, on the opposite side of the Thames, the injury was almost as great as in my own garden; although the night frosts of spring affect the latter much more, as it lies on the side of a large common (formerly a marsh), from which the radiation of heat is very rapid during severe nights.

The conditions which appeared to have been most favourable to plants, during the cold, were exposure to the north, dryness of soil, recent transplantation, layering of the branches, and absence of shade during the preceding summer. Many gardeners believe that recently-transplanted shrubs suffer more from the winter's cold; and this may be the case where they are not rooted afresh, and during windy weather. I am certain, however, that the most recently-planted escaped the best; and the advantage was not confined to those removed in the autumn preceding, but could be distinctly traced in those which had stood two, three, or more years; others of the same age suffering to a greater degree, where longer fixed without transplanting.

The preceding remarks apply to plants in the open ground, not protected in any way, unless so mentioned. I may add further, that the frost penetrated a cold-frame for half-hardy plants; the soil in the pots being hard frozen for ten days or upwards. They were thawed very slowly in the dark. Some were lost, but several Cape Heaths, Oxalides, Pelargoniums, Mesembryanthemums, and Fuchsias escaped with slight injury. *Aloe reviucosa*, *Petunia nyctaginiflora*, *Cyclamen coum*, *Eccremocarpus scaber*, *Saxifraga sarmentosa*, *Salvia splendens*, *Calla Æthiopica*, *Ixia crocata*, *Primula sinensis*, Oranges, Myrtles, Scarlet Ver-

benas, and others usually treated as greenhouse plants, survived the frost, some of them being scarcely affected by it. Flowering roots of *Cyclamen Persicum* were lost, but seedlings raised the preceding summer escaped. Old plants of the Pelargoniums and Mesembryanthemums survived, though young ones of the same species were killed.

Thames Ditton, Surrey,
July 18, 1838.

ON THE SOURCES OF HEAT WHICH INFLUENCE CLIMATE.*

BY A MEMBER OF THE LIVERPOOL NATURAL HISTORY SOCIETY.

MY attention was first directed to the laws which govern the existing temperature on the surface of our globe, through a desire to know how far the recorded observations made at the greatest depth to which we have yet penetrated—all of which shew a greater or less increment of temperature as we descend—could be accounted for by known causes, before they are assigned to a source where some difficulties still demand explanation.

In pursuing these inquiries, I have imperceptibly found myself in a much more extensive investigation than I at first contemplated, with the evidence often not a little perplexing; but as some of the points from which I have received the existing theories, referring to the central mass of our globe, suggest to me doubts as to the consistency of those theories with the observed phenomena, I have thought that it might not be unworthy of the attention of this Society to state where the difficulties occurred to me. My doing so is not from any desire to see shaken the conclusions of some of the most distinguished men of our day, but in the hope that its members, in discussing the subject, may be able to elucidate more correct views, and assist in the promotion of an inquiry to remove objections which have still to be met.

Further, when it is remembered that the heat at the earth's surface is a mean between two opposite extremes, it naturally becomes an object of interest to us to know on what basis the stability of the temperature allotted to the surface of this planet rests; the more so since modern researches tend to prove that, before the historic era, our climates were much warmer than they now are; and also

* We regret that the able author of this paper (read at the June meeting of the Liverpool Natural History Society) will not permit the ensuing pages to appear under the sanction of his name. This, however, by no means weakens the cogency of his arguments, which, we are requested to observe, he is willing to discuss, through the medium of *The Naturalist*, with any one who may question the justness of his positions.—ED.

since it is established, beyond the possibility of a doubt, that the heat of the central matter of the earth, or the cold that pervades the regions through which our globe revolves, would be alike destructive to the existing organization.

The variations of the atmosphere, and its temperature from day to day, form of themselves subjects of almost universal interest. In all ages and nations they furnish a never-ending topic for those who wish to exchange a few words in conversation with strangers or passing friends. And we have very recently seen how, in this advanced age, a few fortunate predictions as to the cold of winter have called forward the public most liberally to patronise their author.

Meteorological changes are powerfully influenced by whatever governs the temperature of the atmosphere. The influence of the solar rays at once presents to us a most active agent; yet it will be seen that the sources of heat which must greatly control such fluctuations, are not in the present state of our knowledge easily determined in value. They appear as yet quite unassignable to any precise law. To be well forewarned of the general character of approaching seasons would be of the utmost importance in a domestic point of view; for this purpose many general rules have been given that are not without their value, though to all of them the exceptions are numerous. Thus an abundant crop of fruit on the plants indigenous to our island, and which grow without any cultivation, is said to precede a severe winter, as for instance the fruit of the Common Hawthorn. Such a belief has been long entertained. Admitting it to be well founded, it only presents to us another beautiful proof of the careful provisions of Nature, as it is during a protracted winter that the spontaneous productions of the wild plants will be most wanted to maintain the numerous classes of wild animals dependent on the food they can procure by their daily search.

Careful attention to the winds at the vernal equinox, noting the date of their occurrence, their direction and their force, are by some believed to afford data for predicting whether we shall have a wet, a cold, a dry, or a warm summer. In Dr. Rees' *Encyclopædia* a table of Dr. Kerwin's is given, by which you may foretell without erring oftener than one in three.

The height of the line of perpetual snow, above the level of the sea, is by much the most easily-fixed standard for judging of the power of the sun's rays under different latitudes. This for the northern hemisphere is well ascertained; but for the equinoctial and southern latitudes we require further data before it can be accurately traced. At a short distance from the North Pole the line of perpetual frost leaves the earth, and ascends till it reaches two or three degrees south of the northern tropic. The ascent was long believed to continue onwards until under the equator. More recent inquirers do not admit this, since they can shew that for two months the solar rays fall as perpendicularly at noon on countries lying between 20 and $23\frac{1}{2}$ latitude, as they do on places directly under the equator, for

the short period of six days at the autumnal and vernal equinox. In June and July the sun, being nearly vertical over the extreme limit of the northern tropic, gives to that latitude the greatest temperature the solar rays are capable of imparting. This necessarily elevates the snow line to its highest point above the level of the sea. On the Andes, at a distance of 17 degrees from the equator, it is found at an elevation of 17,000 feet; directly under the equator it is said to be 1,000 feet lower, but this appears to me to want confirmation; for though the limits of the tropics have nearly two months or more of vertical sun's rays than the equator, it is to be remembered that for all the rest of the year countries under the equator have the solar rays less obliquely than those near the tropics. Since high table-lands have a more elevated temperature than isolated mountains of the same height, it requires caution in the choice of the situations for determining by measurement the snow line. The Himalaya mountains afford a remarkable instance of this on the southern side; where we should expect the sun's rays to have far the more influence, we find the snow line at an elevation 3,000 feet lower than on the northern side, where, in addition to the slope of the ground being most unfavourable for the reception of the solar heat, the station is a degree further from the equator than that of the southern side. An immense table-land of 10,000 feet elevation, stretching from the northern basis of the Himalaya range, thus appears comparatively to reduce the altitude of places on this side of the mountains.

Some observations made on the Andes would certainly seem to support the belief that at the equator the snow-line is depressed below the elevation assigned to it nearer the tropics; but since we have, as yet, no proof that the mean temperature of the year is greater at the limits of the equinoctial regions than under the equator, I think we cannot safely assign a depression of 1,000 feet to the snow-line as it crosses this parallel.—After leaving the southern tropic, we find it descend much more rapidly towards the earth than in the northern hemisphere. Those parts of New Zealand corresponding in latitude to Bordeaux, do not enjoy a warmer climate than the north of England, while Terra del Fuego, though as distant from the South Pole as the country which lies between London and Edinburgh is from the North, has the climate of Norway. The snow-line is elevated only 3,000 or 3,500 feet above the level of the sea, while with us it is not to be found at an elevation under 5,000 feet. The statements of our mariners also prove the severity of southern winters, as they frequently experience difficulty and detention while doubling Cape Horn, from fields of ice extending as far south as the 54th parallel.

It was my wish, from some of the empirical formulæ which have been constructed by Meyer, Sir D. Brewster and others for climate, to ascertain the

mean temperature of the whole earth's surface. These formulæ determine with moderate exactness the temperature of places under the temperate zone, but Meyer's begins entirely to fail for the higher latitudes, while all of them are uncertain in their application to places within the tropics, and to the whole southern hemisphere; also since the computations of Fourier give to high latitudes a degree of cold far greater than these empirical formulæ, I despaired of being able to assign a tolerably true mean temperature to the globe's surface; but this mean temperature will be higher than at first sight might appear, from the circumstance of a degree of latitude and longitude within the tropics enclosing an area so much larger than the same degrees when nearer the Pole. The value of a degree of latitude is invariably sixty geographical miles; but those of longitude regularly diminish from sixty miles on the equator, to fifty-two miles at latitude 30, to thirty miles at latitude 60, or half what they were on the equator, and one mile at 80 latitude. Hence it follows that a large proportion of the superficies of the globe is exposed to a tropical climate; one half of the earth's surface is contained within 30 degrees of north and south latitude; therefore its mean temperature at the level of the sea greatly exceeds that of our climate. Meyer's formulæ would give it at 65, Farhenheit, but this is certainly too high. As already stated, it is in vain in the present extent of our meteorological knowledge to endeavour to arrive at it correctly; but assuming 60, Fahrenheit, as the mean—which is as high as our data will warrant—then let us also suppose the earth free from all central heat, and that it had existed a sufficient time for its mass to attain the mean temperature of its surface; then in penetrating into the earth, under any latitude, and being careful to prevent the heat evolved by the compulsion of the air from affecting the experiments, we should find the temperature slowly to approximate to the mean of the central mass, which in such a case would be the mean temperature of the whole superficies; thus in high latitudes the heat would increase as we descend, while under the equator a diminution of heat would be expected.

The latent caloric in the air, being reduced by its increased density, tends also greatly to elevate the temperature as we descend under every parallel, particularly where currents of air are circulating; but the increment of temperature, as we deepen our mines, is so great that it exhausts both of these recources, and, being further confirmed by experiments conducted with the greatest care, where no currents could vitiate the result, the elevation of temperature must be admitted as altogether independent of solar rays; and we have only left, to account for it, the existence of central heat coeval with the earth's creation.

The profound computations of M. Fourier led to this result; the experimental researches of M. Cordier and M. De La Reene tend towards similar conclusions;

but after admitting the existence of central heat, it will be seen that much doubt prevails as to its intensity, and still more to the existence of a large mass of fluid matter.

The difficulties of the experimental inquiries will be well illustrated by citing those of M. De La Reeve. At 680 feet below the surface he found, in the first instance, an increase of 22 degrees of Fahrenheit above the mean of the climate; continuing his experiments until he obtained constant and uniform results, the amount of elevation of temperature was reduced to $13\frac{1}{2}$ degrees for 680 feet; and the great error of $8\frac{1}{2}$ degrees was solely due to a small quantity of air lodged in the upper part of the cylindrical case containing the thermometer. This air was much compressed as it descended, from the pressure of the superincumbent column of water; and its latent caloric evolved. M. Cordier also found, in mines not two miles apart, that the rate of increment of temperature varied exceedingly, being nearly double in one mine what it was in another. This might be partly due to the many sources of error to which experiments made in mines open to the atmosphere are subject, but M. Cordier, fully aware of these, used his best exertions to avoid them. De La Reeve's experiments, conducted with much exactness, and persevered in till various sources of error were discovered and removed, are worthy of great confidence. He found the increase to advance strictly by an arithmetical progression; he gives it at $1\frac{1}{2}$ degrees, Fahrenheit, for every 100 feet, being not so rapid as the mean augmentation of temperature assigned by M. Cordier, whose results were one degree, centigrade, for 15 metres in France, and one degree in every 25 metres for the earth's surface generally.

If we admit the experiments of M. De La Reeve, confirmed by those of Arago, Fox, and many others, to prove an increase of temperature to proceed on an arithmetical ratio, as we descend below the earth's surface, the heat will ultimately reach a point sufficient to fuse all the materials with which we are acquainted. The spheroidal form of our planet is a strong proof in favour of the primitive incandescence of its mass; but the fusion and recomposition of certain rocks by any artificial means long stood in the way of this hypothesis, until a distinguished German chemist, M. Mitscherlich, succeeded to fuse the most refractory, and also to recompose, from the substances found in them by analysis, crystals of the same form and character as those that were natural. As Cuvier, in a discourse on the progress of Chemistry, has treated fully of this valuable discovery, with its influence on the theory of central heat, I gladly avail myself of the words of this extraordinary man :—"It seems," says he, "almost to carry at last to a rigourous demonstration a celebrated hypothesis, advanced without proof by Descartes, Leibnitz, and Buffon, and to which the recent labours of Laplace had already given a high degree of probability; we may regard it,

then, as a circumstance nearly completely proved, that the earth possesses a heat of its own, independent of what it receives from the sun, and being the remains of its original heat. This return to ideas long since put forth by our greatest men, shews that it is never safe to slight even the boldest conjectures of men of genius; it is one of their privileges that truth often appears to them in their dreams." Since we then have a central temperature sufficient to fuse all the materials we meet with on the earth's surface, it must necessarily follow that the mass of heated matter in the centre is in a fluid or incandescent state—unless we can shew that the enormous pressure which can be demonstrated to exist on the matter in the interior of our planet retards or prevents its fusion. There is no chance of our being able to experiment with matter under a pressure any thing at all approaching that to which it must be subjected at depths considerably below the earth's surface. No experiments, that I am aware of, go to prove solid matter to be of more difficult fussion when under a heavy superincumbent weight; but the certain knowledge of the existence of these great pressures inclines me to the belief that matter may there possess properties of which we know nothing.

It can be demonstrated that the attraction at any point within a sphere of equal density, or of successive concentric strata of uniform but unequal densities, is always as the distance from the centre. Therefore the whole pressure of a column of homogeneous matter from the circumference of the earth to its centre, will be half what the same pressure would be if the attractive force were uniform throughout. This will give for matter of the mean density of our planet a force equal to a million and a half atmospheres exercised by the superincumbent mass at the earth's centre. Water at the centre would be under a pressure of 330,000 atmospheres. Such a force might retain it as a solid, though even at a high temperature; but here, also, we are left to conjecture, as we have no experiments made on fluids under great pressures to guide us.

Arago and Dulong have given an empirical formula for ascertaining the temperature at which water begins to assume a gaseous state under pressure. This is verified by experiment only so far as $5\frac{1}{2}$ atmospheres; there is therefore a difficulty in extending it to great weights; the furthest it has been attempted by its authors is to 1,000 atmospheres, where it may not greatly err. Water at the depth of six miles below the level of the sea is nearly under this pressure, though Arago's formula shews that it will require a temperature above a red heat, and higher than that of melted Zinc, to bring it to the boiling point. This sufficiently demonstrates how different may be the state of matter at depths in the earth from what we know of it on the surface.

The late Sir John Leslie concluded, from an inquiry into the elasticity of solid bodies, that at a distance of a few miles below the earth's surface, a specific

gravity would be obtained greater than that which, from astronomical data, we know our globe to possess; and as their density would go on increasing as we continue to recede from the surface, he was led to conjecture that the terrestrial sphere had a hollow centre. He further came to the striking result, that air will, at considerable depths, from its higher elasticity, become heavier than water; if we then grant that water at the greatest depths of the ocean contains air in solution, as we find it to do on the surface, LESLIE's theory will tend to the conclusion that the ocean rolls on a bed of air. He adopts this view, and endeavours to connect it with some of the phenomena of volcanoes.

To suppose the seats of volcanic fire at the depths LESLIE has done, would bring us to internal pressures on parts of the crust of our globe exceeding, on the most moderate scale of computation, 20,000 atmospheres. This appears to me to render it extremely improbable that the seats of volcanoes are deep in the earth's surface. In practice we know of no pressures equal to 100 atmospheres; we also find how difficult it is to construct metallic vessels able to resist the force of a few atmospheres; the materials of the crust of the globe are, moreover, of a composition not well calculated for the resistance of pressure. Yet there is no doubt, from the data furnished us by volcanic eruptions, that during such events a small portion at least of the earth's crust must be capable of overcoming a considerable force.

We have only to suppose the centre of volcanic fire to be 2,100 feet below the orifice of a crater in activity, to have there an internal pressure of 100 atmospheres. There are on record many eruptions where lava was discharged in large quantities that must have proceeded from depths greater than this; but I am much inclined to assign to the centres of volcanic eruptions a position as near the earth's surface as is consistent with recorded phenomena. I am very hostile to connecting them with the incandescent matter occupying the earth's centre, chiefly from the consideration that they would then communicate when in an active state an enormous force over every point of the interior of the inclosing crust; there are other reasons that render such an hypothesis extremely improbable.

Fluids, wherever situated, must be influenced by the all-pervading law of gravitation. The attraction of the sun and moon will develope tidal waves in every considerable mass of fluid matter; hence, in the event of a crater communicating with such a mass, we should look for its discharge being varied by tides; from this circumstance I think it can be proved that they are not in connexion with any great quantity of fluid.

The existence of internal tides bears on another question. If the solid surface of the earth be comparatively only a thin crust, we should have a powerful diurnal tide, which would occasion violent dislocations in the strata. This view

well accords with the remote era when the earth was yet uninhabited, and covered only with a thin stratum. It helps to explain the great revolutions to which those periods were subject; but since the historic era, the crust must either have acquired sufficient strength to overcome the force of these internal tides, or we may suppose the matter to have viscidity enough to resist the diurnal attractive influence of the sun and moon. In every view there appear to me strong reasons for believing that the volcanoes have their origin at no great depth, and are entirely due to local causes. Further, admitting the existence of a primitive central heat, its power to retain the central mass of our earth in a fluid state appears to me very problematical.

A distinguished French philosopher, M. Fourier, has made the influence of a central heat on the temperature of our climates the subject of rigorous mathematical investigations. He has shown its existence to be perfectly consistent with a uniform temperature of climate since the commencement of the historic era. The planetary mass will require a period of 4,000 years to lose by spotaneous cooling one-sixth of a degree of Fahrenheit, while the loss of heat through the cooling of a century is much less than the loss of solar heat as we pass from season to season.

Fourier has further shewn, that the influence of the primitive heat in our planet is scarcely felt by the climates on its surface. Their temperature cannot on an average be raised above one-sixth of a degree of Fahrenheit through this source; so that local improvements may elevate the temperatures far more than they can ever be deteriorated by any loss of primitive heat, if indeed that source be at all capable of ever sensibly affecting them. These results of Fourier are of great value, since they restore confidence where the researches of Buffon and Leslie made the permanent stability of our climate doubtful. History is also strongly in favour of a fixed standard for our climates; where there is a change, it is an improvement; for we know the climate of modern Greece and Italy to have much milder winters than those assigned them by the ancient Greeks and Romans.

Jefferson was of opinion that the climate of the United States was rapidly improving; but more recent observers would seem to say, that the clearing of that country has the effect of elevating the summer heat, while it equally depresses the cold of winter.

The effect of the temperature of the regions of space on the climates of the globe is a question that originated entirely with M. Fourier; for what we know of the subject we are indebted to him. He has assigned the temperature of minus 58, Fahrenheit, or colder than freezing mercury, as the heat of the planetary space. Of its influence on our climates it will be best to quote his own words, as given in a memoir in the *Annales de Chimie et Physique*. He says:—

" If the terrestrial globe and all the bodies which compose the solar system, were placed in an inclosure devoid of all heat, phenomena would be observed entirely contrary to those which we now know to exist. The polar regions would endure an immeasurable cold, and the decrease in the temperature, from the equator to the poles, would be incomparaby more rapid and extensive.

" Upon the hypothesis of the absolute cold of space, if it is possible to conceive it, all the effects of heat, such as we observe them on the surface of the globe, would be owing to the presence of the sun; the least variations of distance from that orb would occasion very considerable changes of temperature in the earth.—At the commencement of night the surfaces of bodies would be instantaneously exposed to an infinitely intense cold, and organic bodies would not be able to withstand the equally sudden action of a contrary description, which would take place on the rising of the sun."

Thus we perceive that this low temperature assigned to the celestial regions through which our planet moves, has a most vigorous effect on the climate at the earth's surface; its power will be invariable for every point of the globe, whether placed under the torid zone or within the polar circle, whether on a level with the sea or in elevated mountain ranges.

That the rays from the moon are totally devoid of any calorific effects, seems to have been recently finally set at rest, from experiments made by the beautiful thermo-multiplier of MELLONI; this leads to the conclusion that the surface of that luminary possesses only the temperature of the planetary spaces, and there, in the absence of the solar rays, cold will be experienced of minus 58, FAHRENHEIT. From this it may be inferred that organic bodies, such as we are acquainted with, cannot exist on the moon's surface.

Only one other source of heat known to us remains to be spoken of. It is the caloric, either given out or absorbed in every process, whether natural or artificial, which involves change from one state to another. This cause will act on climates generally chiefly through the spontaneous variations in the hygrometric state of our atmosphere; and it will be through this indirect channel that the artificial processes of cultivation are capable of improving climate. Other artificial means, derived from the works always carried on in densely-peopled districts, or in cities, modify the temperature to an extent of one or two degrees of FAHRENHEIT.

The climate of London is considerably changed through this, the mean annual temperature exceeding that of the surrounding country by half a degree; the difference would be greater were it not that London, always veiled by smoke from the full power of the sun, has a colder mid-day temperature than its environs, while the nights of mid-winter are nearly four degrees higher than the heat of the surrounding country.

We have now seen that the heat which influences our climates may be traced to the four following sources:

1. The calorific power of the solar rays, which are well known to vary directly with the latitude.

2. The temperature of the planetary spaces, which apply equally to every portion of the earth's surface.

3. The heat of the central mass of our earth.

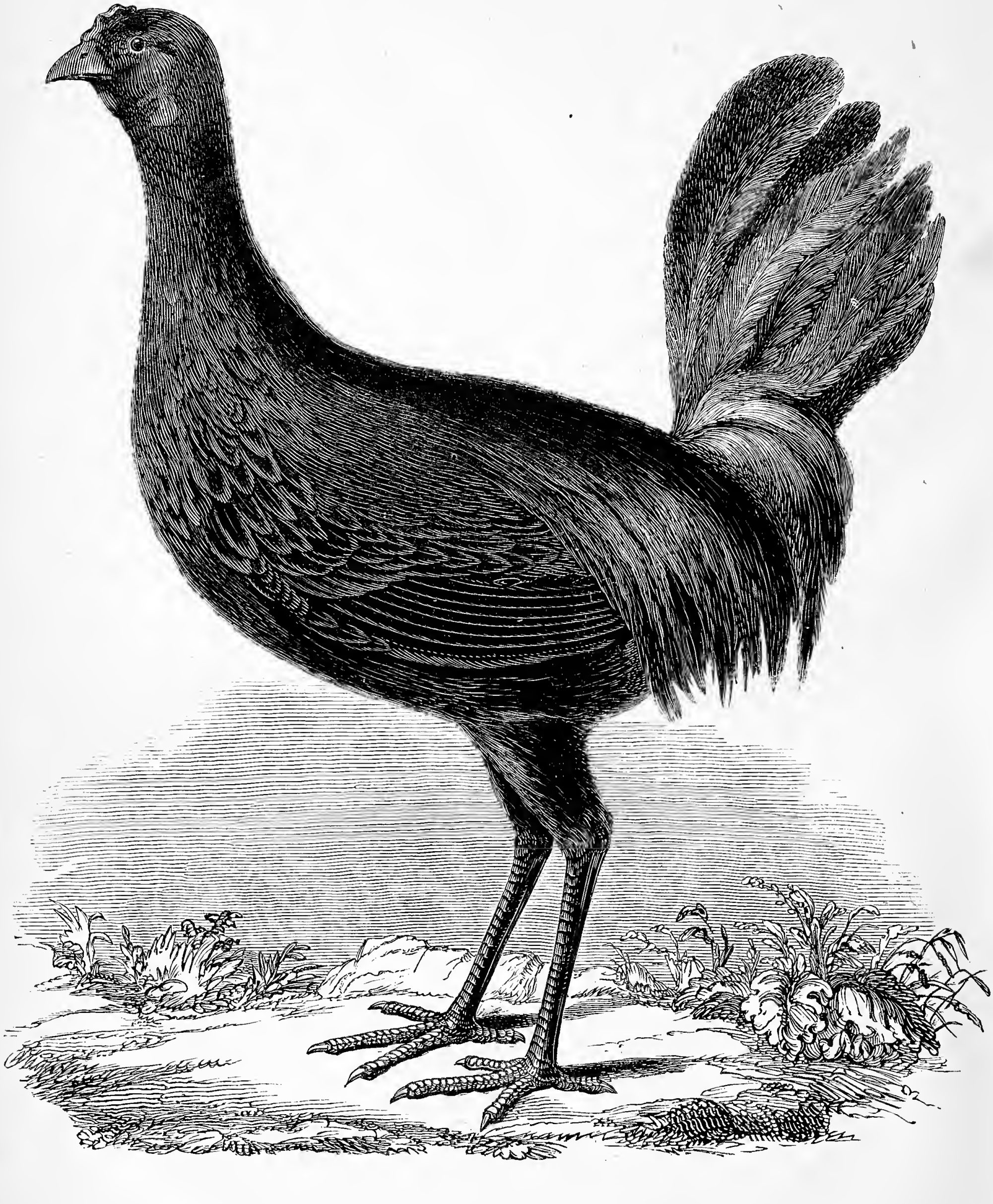
4. The caloric changed by every variation from one state to another.

Of these sources of heat the two first govern, for the most part, our various climates; besides their influence, it is scarcely necessary to add that other circumstances have much effect on climate, as, for example, the hygrometric state of the atmosphere, the proximity of other continents, the prevailing winds, the character of the soil, and several others that form of themselves a distinct branch of inquiry, but which it is not necessary for me now to enter upon. Their effects are at once made obvious by referring to the isothermal lines, or lines of equal temperature traced by Humboldt, which can be shewn to deviate much from the parallels of latitude.

In Europe the position of places with the same annual heat does not differ more than eight or nine degrees, but the difference of those having the same winter temperature is not less than 18 or 19 degrees. The winter of Scotland is as mild as Milan in North Italy. Ireland is remarkable for mild winters and cold summers. The mean temperature in Hungary for the month of August is $71\frac{1}{2}$ degrees; while in Dublin for the same month it is only $60\frac{1}{2}$ degrees. New York has the summer of Rome and the winter of Copenhagen. Quebec has the summer of Paris and the winter of St. Petersburg. In the same manner, at Pekin, which has the mean temperature of Britain, the heat of summer is greater than at Grand Cairo in Egypt; and the cold in winter as severe as at Upsal, in Sweden.

These inequalities are due to a complex set of phenomena which regulates the machinery of climates. It is uncertain if we shall ever be permitted to view this machinery; but there can be little doubt that we should there see the same system of compensation for apparent irregularities as the imperishable labours of Newton and La Place have shewn to us in the movements of the heavenly bodies; and which there are ample reasons for our supposing to extend to all the other works of Nature.

[The object of *The Naturalist*, as expressed in the title-page, and as carried out in the body of the work, is to illustrate the animal, vegetable, and mineral kingdoms. But we feel assured that neither our readers nor ourselves can object to an occasional digression into collateral branches of Natural Science. Or did such a scruple exist, surely it would altogether vanish on perusal of any paper so interesting and so ably written as the preceding.—Ed.]



VARIETY OF THE COMMON FOWL, FEMALE.

ON THE EXCITING CAUSES OF VARIETIES IN BIRDS AND OTHER ANIMALS.

By Neville Wood, Esq.

In various numbers of *The Naturalist*, correspondents have recorded instances of varieties in birds and other animals which have fallen under their observation, or come to their knowledge. In the present paper we propose briefly to explain our views respecting the exciting causes of these curious modifications.

The Common Fowl (*Gallus domesticus*, Auct., *Phasianus gallus*, Linn.), originally derived from Asia, is now scarcely known in its native haunts; but has long been extensively cultivated as a domestic bird in almost every country. What influence may be drawn from these facts? Now we are of opinion, that, *cæteris paribus*, the more thoroughly and the longer any animal is domesticated, and the more the domesticated differs from the wild state, the more subject will that animal be to variety, and the more remarkable will the varieties be. Both arguments and facts fully support this theory; and what we at first considered a mere hypothesis, has at length ripened into a matter of demonstration.

Thus, varieties of birds inhabiting extensive tracts of fen-land, wide and arid plains, or the summits of bleak mountains, little frequented by Man, are seldom noticed, because they rarely occur. The ordinary changes of plumage, termed moulting, there take place with almost unerring regularity, as, for instance, in the various Ptarmigans of the hill-top, the Waders (*Grallatores*) of the moist and sedgy river-side, the Petrels, Ducks, and Gulls of the "wild unbounded sea," &c. All these, and many others, live strictly according to their nature.

A second class furnishes the collecting naturalist with occasional varieties. Thus the Wild Duck (*Anas boschas*, Linn.), which abounds throughout the year in the fresh waters of Britain, is necessarily partially, though but little, under the jurisdiction of Man. Varieties are accordingly occasionally met with, from the dark rich colour of the natural state to a chocolate hue, or even pure white. The Partridge belongs to the same division, and yields an occasional variety. The Pheasant and the House Sparrow depend still more upon our bounty and our works, and hence varieties are tolerably frequent in these species, though not very much so, considering the great abundance of these birds in almost every part of the country. Sparrows occur black, white, and cream-coloured, and the varieties of the Pheasant—an imported species, and half domesticated—are still more frequent and diverse.

Lastly, we come to the wholly-domesticated races of birds. In the two former classes the varieties form the exceptions to a general rule; but here the

modifications are endless; and not only do they in time become to the full as frequent as the normal state, but in the course of successive generations it in many cases actually becomes impossible to ascertain which is the natural plumage of the bird. In most instances some of the descendents of domesticated breeds retain nearly their original aspect, but they are always larger, and of a heavier and duller appearance. As regards size, and quality of flesh, the domesticated breeds have a decided superiority, and the quality of the latter may be greatly modified by food, &c. But it is in plumage that the change is first noticed. Normally-coloured Ducks, Pintados, and Fowls, for example, often produce milk-white offspring in the second and third generation, if the parents have been reared in captivity; and similar departures from the natural state are not slow to appear in the descendents of wild-caught birds.

To these general rules exceptions will occasionally occur. Thus we have seen a white variety of the Coalhood (or "Bullfinch"), of the Whin Linnet, the Golden-crested Kinglet, the Common Snipe, the Corn Bunting, and other perfectly wild birds. But "the exception," in a certain sense, "proves the rule."

If, however, modifications of size and shape are more tardy of appearance, they are at least as interesting to the reflecting naturalist as those of plumage, and infinitely more perplexing. Who can question this after endeavouring to ascertain the original stock of the Horse, the Dog, and the Cat amongst the Mammalia, and of the Bantam, game, dunghill, Polish, French, Malay, and an infinity of other Fowls among birds? It is not mere colour that forms the puzzle. Were this the case, the difficulty would at once vanish. But the singular discrepancies of size, and the still more extraordinary modifications of general shape and other characters, seem to defy science. And yet these very varieties—so called because we cannot find their analogues in the woods and wilds—would unquestionably, and very justly, be considered distinct species if found in a state of Nature. That these varieties, despite their natural and artificial intermixture, should still remain distinct—that the offspring of half-Bantams and Bantams, for instance, instead of forming new varieties, should, in the end revert to the true Bantam type, is singular. But it would have been passing strange, had these really been distinct races, that no notice should have been taken of them by the diligent naturalists of a former day. We can only gain intelligence of one species in the country from whence all our Fowls originally came; and therefore, though the point can scarcely be considered as proved, it is the smaller of two difficulties to refer all the modifications of Fowls to a common stock.

One of the most remarkable varieties—and one not commonly observed in a marked degree—is the assumption by the female of male attire, aspect, and habits. Hens occasionally make a faint attempt at crowing—a circumstance

considered so dangerous by the farmer's wife, that she generally contrives stealthily to put the obnoxious birds out of the way. The most remarkable hen of this kind which we remember to have seen, is that of which we have attempted a delineation at the commencement of our present number. It was purchased amongst many other Fowls, and was kept several years in the poultry-yard at Scampston Hall, near Malton, in this county. We believe it was never known to crow. It is generally believed that these "cock-hens" are barren; but this we are enabled most distinctly to deny. It is an interesting fact that the hen figured in our current number not only laid eggs, but hatched them, and took every possible care of her brood. This fine bird was at length chased into a Duck-pond, and drowned, by two of those quarrelsome creatures the Pintado. This latter bird, though peaceable enough with its own species, is a perfect terror to other kinds of poultry. We have even known it attack and drive away a well-trained pointer Dog! Fowls, on the contrary, extremely quarrelsome among themselves, never molest other birds unless first attacked by them, or when disturbed at feeding-time.

The beautiful specimen to which we have alluded was stuffed by an amateur of the art of animal-preserving, Matthew Hayes, Esq., of Pickering. It is of the size of a very large cock, and had the brilliant metallic tints, the waving tail-feathers, and the long pendent neck-feathers characteristic of the male. The comb is intermediate between the average of the ordinary cock and hen. The rudiments of hard and powerful spurs may be observed; the plates of the tarsi are large, but as they are neither loose nor much imbricated, this must be considered rather as another indication of approach to the male than as a sign of age. Indeed the character of these plates, and of the spurs, induces us to consider it a middle-aged individual. The bird is well proportioned, but very muscular in all its parts. It has much the air of a cock between the game and dunghill breeds, but the head is smaller, and the neck thinner. Unfortunately this hen was moulting when it died, and has therefore less of the male character than would otherwise have been the case. In all probability, each of the unusual characters noticed above would have been increased had the bird lived a few years longer. Undoubtedly its spurs would have grown very considerably. We have seen old hens, with the ordinary plumage and general aspect, and very good sitters, with long sharp spurs like a cock.

It would be interesting to notice the changes induced by age and moulting on these "cock-hens." Perhaps they become barren at an earlier period than other hens. If so, the notion respecting their unconditional sterility is partially accounted for. The specimen figured in the plate died some twelve or fourteen years ago, and still remains in our collection.

Game cocks which have fought often and desperately sometimes change colour

from white to the true game-breed hue, and *vice versâ*, three or four times in their lives. The cause is over excitement of the passions, and too much exercise. The effect of these and other stimuli in Man is to turn the hair white, or to cause it to fall off, partially or entirely.

Campsall Hall, July 28, 1838.

ON THE HABITS AND PECULIARITIES OF BRITISH PLANTS, AND ON THE DERIVATIONS OF THEIR LATIN NAMES.

By T. B. Hall.

(Continued from p. 376.)

Antirrhinum.—Αντιρρινον, from αντι, resembling, and ριν, a nose, from the appearance of the flowers of some of the species resembling a calf's snout.

Antirrhinum majus, Great Snapdragon.—In Russia this plant is said to be cultivated for its seed, which yields an oil little inferior to that of Olives. Though the seeds vegetate on the ground, it is only in dry soils and situations that the plant continues to live long enough to produce flowers. It is probably not originally indigenous, but certainly a valuable acquisition even to the flower-garden, into which several striking varieties have been introduced, with blossoms of finely-contrasted red and white, or altogether of the richest crimson. "The flowers of these plants are perfect insect-traps. Multitudes of small creatures seek an entrance into the corolla through the closed lips—which upon a slight pressure yield a passage—attracted by the sweet liquor found at the base of the germen; but when so admitted there is no return; the lips are closed, and all advance to them is impeded by a dense thicket of woolly matter, which invests the mouth of the lower jaw—

> 'Smooth lies the road to Pluto's gloomy shade;
> But 'ts a long unconquerable pain,
> To climb to the æthereal realms again.'

But this Snapdragon is more merciful than most of our *Muscicapæ*. The creature receives no injury; but having consumed the nectareous liquor, and finding no egress, breaks from its dungeon by gnawing a hole at the base of the tube, and thus returns to liberty and light. The extraordinary manner in which the corolla is formed, the elastic force with which the lower limb closes and fits upon the projection of the upper, manifest the obvious design of the great Architect, 'whose hands bended the rainbow;' and the insects are probably the destined agents whereby the germen is impregnated; for as soon as this is effected, the

limbs become flaccid, lose their elasticity, and are no longer a place of confinement. The Ant is a common plunderer of this honey."—*Journal of a Naturalist.* See also note to *Drosera.* The ingenuity of Bees has been remarkably exemplified in this species of *Antirrhinum*, and also in the Yellow Toadflax (*Linaria vulgaris*), and some other plants whose flowers, from their long tubular formation, deny admission to the broad head and thorax of the insect. Well knowing the exact position of the prize he vainly seeks to obtain by usual means, he pierces the calyx as well as the tube with his horny proboscis, inserting it into the orifice, and thus readily abstracting the honey. All the varieties of Snapdragon have the power of maintaining a state of vegetation in great droughts, and their usual stations are peculiarly exposed to the influence of the sun. Dr. THRELKELD assures us that during the prevalence of Popery, "many frivolous superstitious fables were reported of the power of this plant against spectres, charms, and witchcraft, rather savouring of rank heathenish magic, than comporting with sound reason; for the use of reliques, *Agnus Deis*, &c., are wicked trumpery, and defending against the Devil's sword with the Devil's buckler." The whole capsule has been compared to the skull of a calf; but the old name Calf's-snout rather applies to the mouth of the corolla. A rude figure of this Snapdragon, but which cannot be mistaken, exists in the famous Vienna manuscript of DIOSCORIDES, under the name of Κυνοκεφαλιον, or Dog's-head, and is engraved in DIOSC. *Ic.*, t. 103.

Antirrhinum orontium, Lesser Snapdragon.—The capsule is ovate, with three pores, each opening by a lid, and when nearly ripe it resembles the face of a Monkey or Bat.

Apargia.—Name of uncertain origin. Απαργια was applied to some plant of this tribe.

Apargia autumnalis, Autumnal Hawkbit.—This has not been applied to any particular use, nor is it, though common, a very troublesome weed. It varies much in luxuriance, and is often found thriving in extremely poor land newly turned up.

Apium.—ISIDORE says it is so called from *apex*, the top, on account of its head of flowers. Others, from *Apis*, a Bee, because they frequent it; or from ηπιος, Dor., απιος, mild. According to HOOKER, from *apon*, water, in Celtic; because it usually grows in watery places.

Apium graveolens, Smallage Parsley, Wild Celery.—The whole plant, in its native ditches, is acrid and dangerous, with a peculiar, rank, coarse taste and smell. The effects of cultivation in producing from this plant the mild and grateful Garden Celery, are not a little remarkable; for which, and its name, we are indebted to the Italians. Celery has now supplanted our native Alexanders, *Smyrnium olusatrum.* According to the observations of LINNÆUS, Sheep and

Goats eat this plant; Cows are not fond of it; Horses refuse it. The seeds yield an essential oil.

The larvæ of *Alysia Apii* (CURT. *Brit. Entom.*, Vol. III., t. 141) feed on the leaves of the cultivated varieties of this plant.

Aquilegia.—From *aqua*, water, and *lego*, to gather; from the shape of the leaves, which retain water; or, according to HOOKER, from *Aquila*, an Eagle, whose claws the nectaries resemble.

Aquilegia vulgaris, Common Columbine.—The beauty of its blossoms has long introduced the Columbine into our flower-gardens. Goats eat it. Sheep are not fond of it. Cows, Horses, and Swine refuse it. The elongated and incurved nectary of this flower seems to bid defiance to the entry of the Bee in search of the hidden treasure; but the admirable ingenuity of the sagacious insect is not to be thus defeated, for on ascertaining the impracticability of effecting his usual admission, with his proboscis, he actually penetrates both calyx and blossom near the depôt of the honey, and thus extracts the latent sweets without further difficulty. Cultivation produces various colours; and Mr. PHILLIPS observes, in *Flora Historica*, the singular circumstance that it has three distinct modes of doubling its flowers, viz., by the multiplication of its petals, to the exclusion of the nectaries; by the increase of the nectaries, to the exclusion of the petals; and frequently by the multiplication of the nectaries while the proper petals remain.

Arabis.—Originally from Arabia, but this name is not very precise, as the species of the genus are found in many parts of the world, in arid, stony, and sandy places, in cold and mild climates.

Arabis turrita, Tower Wall-cress, Tower Mustard, Great Turkey-pod.—The whole plant is of a light green colour; it is a native of Spain, France, Switzerland, Italy, Sicily, and Transylvania, on mountains, in hedges, and coppices. In Britain it is one of our rarest natives, and may, probably, have escaped from gardens. It is said to have been observed by Professor J. MARTYN, before the year 1732, on a wall at Lewisham, in Kent. Many of the exotic species of this genus, especially the perennial ones, are interesting little plants to the botanist, and are well adapted for rock-work.

> "——————— The fall of kings,
> The rage of nations, and the crush of states,
> Move not the man, who from the world escaped,
> In still retreats, and flowery solitudes,
> To Nature's voice attends, from month to month,
> And day to day, thro' the revolving year,
> Admiring sees her in her every shape,
> Feels all her sweet emotions at his heart,
> Takes what she lib'ral gives, nor thinks of more."
>
> THOMPSON.

Arbutus.—MINSHEW says it is so called *quia crescit inter arbusta*, because it growes in shrubby places. THÉIS derives it from *ar*, rough, or *austere*, and *boist*, a bush, in Celtic. Or it may be diminutive of *arbor*, a tree; as resembling a tree in miniature. It is the badge of the Highland Clan Ross.

Arbutus Alpina, Mountain Strawberry-tree, Black-berried Alpine Arbutus, Black Bear-berry.—The berries are smooth, black, of the size and somewhat the flavour of black currants, but are not so good. Goats refuse it.

Arbutus unedo, Common Strawberry-tree.—It is a beautiful evergreen ornament to our shrubberies (where also may be observed pink, and double varieties, but the latter are scarcely desirable, as they are incapable of forming the more interesting berries), not only on account of its foliage and flowers, but of its fruit, which is pleasing to the eye, though not grateful to the taste. The pitcher-shaped blossoms contain a delicious repast for Butterflies of various kinds. Frequently may they be observed busily engaged with their long and elegant proboscis, rifling its hoarded sweets. It has been remarked by Mr. SALISBURY, that the fruit taking twelve months to come to maturity, this plant exhibits simultaneously, and during the depth of winter, the singular phenomenon of lively green leaves, beautiful flowers, and brilliant fruit: thus realising the exuberant picture of TASSO—

> "*Cô fiori eterni, eterno il frutto dura*
> *E mentre spunta l'un, l'altro matura;*"*

fit emblem of that perpetual spring which, in original perfection, pervaded the whole earth, when

> "Green all the year; and fruits and blossoms blush'd,
> In social sweetness, on the self-same bough."

WHEELER observed the fruit in the market at Smyrna; and at Constantinople it is offered for sale threaded on a straw or blade of Grass. The country people, however, in Ireland, eat it, but always drink water after it. A warmer climate may possibly render the berries more palatable, though the testimony of the ancients is not in favour of their being wholesome food; see PLINY, DIOSCORIDES, and GALEN. The leaves may be usefully employed in tanning leather. VIRGIL alludes to the young branches as winter food for Goats—

> ——— "*jubeo frondentia Capris,*
> *Arbuta sufficere;*"

and to its use for making agricultural implements, or basket-work—

> "*Arbuteæ crates;*"

while OVID celebrates its blushing fruit—

* With never-fading flowers, and ever-during fruit; while the one expands, the other matures. —ED.

——— "*pomoque onorata rubenti*
Arbutus;"

yet so bitter withal, that PLINY is supposed to have denominated it in *Unedo* because only one can be eaten at a time. TOURNEFORT informs us that a spirituous liquor is distilled from the fruit, especially in the Isle of Andros. The old Italian poet SANNAZARO, in his *Arcadia*, represents this truly classical evergreen as employed by the Roman shepherds to decorate their flocks, on the festival of the goddess PALES. It is generally supposed to thrive most luxuriantly in a moist situation. We learn from the *Bon Jardinier* of M. PIROLLE, that *Arbutus* trees raised from English seed are hardier than those produced from the seed of warmer climates. In the Levant it attains to a great size: in our pleasure grounds sometimes to twenty feet in height; and we can imagine no tree to afford a more refreshing canopy in its luxuriant growth; for we may presume that even HORACE (no incompetent judge of luxury) occasionally sought repose beneath its shade—

"*Nunc viridi membra sub Arbuto*
Stratus."

The right of this plant to be considered an aboriginal,

"Arbutus, with his scarlet grain,
That richly crowns Irene's plain,"

has been contested by Mr. SMITH in his *History of the County of Kerry*, in which he conjectures it may have been introduced by the monks of St. Finnian, who founded the Abbey in the sixth century.

Arbutus uva-ursi, Red Bear-berry, Red-berried Trailing Arbutus.—The berries are insipid, pulpy, and mealy, but afford excellent food for game. The plant is much used in Sweden to dye an Ash-colour, and to tan leather. Horses, Cows, Goats and Sheep refuse it. The *coccus uva-ursi*, which, with alum, affords a crimson dye, is now neglected.

Arctium.—Αρκτιον, from Αρκτος, a Bear; so named from its roughness, and the coarse texture of the involucres.

Arctium lappa, Common Burdock, Bur, or Clot-bur.—The calyx, when in seed, easily breaks from its stalk, and is well known by the name of a bur, sticking to the coats of animals, and the hair or clothing of young rustics, which can hardly be cleared of such incumbrances without breaking the scales asunder and scattering the seeds. The surface of the herbage leaves a slightly viscid, very bitter, exudation on the fingers. The plant itself, a cumbrous weed, is removed, the first year of its growth, by stubbing, like other things comprehended by farmers under the name of "Docks," and paid for accordingly to the weeder. Dr. WITHERING states that before the flowers appear, the stems, stripped of their rind, may be boiled and eaten like Asparagus. When raw they are palatable with oil and vinegar. The seeds are recommended as diuretic: and are accept-

able to birds. Boys catch Bats by throwing the prickly heads into the air. These hooked points tend to the dispersion of the seed, by adhering to the coats of animals, &c. Cows and Goats eat it. Sheep and Horses refuse it. Swine are not fond of it. The larvæ of the Ghost Moth (*Hepialus Humuli*) feed upon the roots, and the larvæ of the Mottled Orange Moth upon the stems: within which the chrysalis may be found about the month of August, especially in stunted specimens.

SKETCHES OF EUROPEAN ORNITHOLOGY.

Gould's "Birds of Europe," Part XVI.

By Neville Wood, Esq.

(Continued from p. 359 of this Volume.)

Since the appearance of *The Naturalist* for July, we have received *The Analyst* for the same month, and are glad to find that the articles on Mr. Gould's work, commenced by ourselves, will be continued in that Journal, as we consider it due to its subscribers that the series should not be left unfinished. The paper in *The Analyst* for July, however, appears to be a mere condensed analysis, and is probably not written by a practical naturalist. At all events the errors it contains have an awkward appearance; the same attention is paid to the most common as to the rarer species, and important particulars are often passed in silence. Our aim is to impart to the student, and to our readers generally, a correct knowledge of the rarer British birds, and of exotic species, conceiving that Sparrows and Sparrow Hawks must be familiar to any one who desires to learn their history. We wish, moreover, by interspersing remarks of our own, and those of other authors, among those which we distinctly acknowledge, by marks of quotation, to be obtained from our author, to render the papers still more useful, less servile, and more satisfactory both to Mr. Gould and to our subscribers. Therefore, while applauding the spirit which has induced the present Editor of *The Analyst* to continue the critical articles in his Journal, yet, for the reasons above cited, as well as on account of the desire expressed to that effect by several of our most esteemed correspondents, we shall, as before proposed (p. 353), conclude the present series in the pages of *The Naturalist.*

Part XVI.—Gorget Calliope, *Calliope Lathamii*,—Calliope, *Fr.*—Our author has constituted a new generic group for this species, which appears to hold an intermediate station between the Thrushes and the Nightingales, having many points in common with the members of both those genera. "In naming this

species after the venerable Dr. LATHAM, we are influenced by a desire to render a tribute of respect to one who has laboured much in the science of Ornithology, and who at an extremely advanced age is now cheerfully passing the remainder of his days in the enjoyment of every domestic felicity, universally honoured by his cotemporaries."* We can heartily participate in the feelings of our author towards his illustrious predecessor, though at the same time we are inclined to question the propriety of naming the species after Dr. L.—The figures, of a male and female, are excellent. Inhabits Siberia, Kamtschatka, and Japan, and has occasionally been taken within the boundaries of Europe. Of its habits little is known. "It is said to have have an agreeable song, which it utters while perched on the topmost branches of trees." The female is altogether of a lighter colour than the male, but differs from the other sex most remarkably in the absence of the beautiful scarlet gorget.

BARROW'S GARROT, *Clangula Barrovii.*—An admirable figure of a male, natural size. This bird was discovered in America by Dr. RICHARDSON and Mr. SWAINSON, and was first met with in Europe by T. C. ATKINSON, Esq., of Newcastle-on-Tyne, when on a visit to Iceland a few years since. "Notwithstanding," observes Dr. RICHARDSON, "the general similarity in the form and marking of this bird and the" Goldeneyed Garrot, Barrow's Garrot "is distinguished by the purer colour of its dorsal plumage, and the smaller portion of white on its wings and scapulars. Its long flank feathers are also much more broadly bordered all round with black. The bases of the greater coverts in the Goldeneye are black; but they are concealed, and do not form the black band so conspicuous in *Clangula Barrovii.* The specific appellation is intended as a tribute to Mr. BARROW'S varied talents, and his unwearied exertions for the promotion of science." The male is at once distinguished from the other sex by the white patch on the cheek, and also by other characters.

BLACKTHROATED THRUSH, *Turdus atrogularis,*—Merle à-gorge-noir, *Fr.*—The plate represents, in an extremely beautiful manner, a male, and a young male or the female, of the natural size. The plate is well worthy the fame of Mr. GOULD as an ornithological painter. "Although TEMMINCK states that it is a native of Hungary and Russia, but rare in Austria and Silesia, we have only seen two native-killed specimens, which are in the collection of Vienna, and one of them was, we believe, killed in the neighbourhood of that city: young birds are also said to have been taken in Germany. From the circumstance of most of the collections from the Himalaya mountains containing examples of this bird, the fact is clearly established that the northern and higher regions of Asia

* See *The Naturalist*, No. vii., for April, 1837, for a brief memoir of Dr. LATHAM, who departed this life the 4th of February, 1837. We hope, at an early period, to present our readers with a portrait and more extended biographical notice of this celebrated man.

constitute its native habitat. Our knowledge of this species is so limited that we are unable to state with certainty whether the black gorget is characteristic of the summer plumage, or whether, when once acquired, it is permanent: we suspect the latter to be the case, as we have received specimens in various stages of plumage, some of which were totally devoid of the black throat, while others had it partially developed; in all probability these last were females or immature birds."

YELLOW BUNTING, *Emberiza citrinella*,—Bruant jaune, *Fr.*—Gold Ammer,* G.—A male and female are represented: the former being a very pleasing figure of this beautiful bird. Confined to Europe, where it is everywhere indigenous and extremely abundant. We need proceed no further with its history.

MARSH HARRIER, *Circus rufus*,—Busard de-marais, *Fr.*—Falco albanella, *It.* —Sumpf Weihe, *G.*—LEAR has here displayed his talents to great effect in figures of an adult and a young bird about three-fourths of the natural size. Inhabits the low marshy portions of Europe, Africa, and a considerable part of Asia. From the circumstance of most of the individuals of this species shot in Britain being young birds, our author opines that but few Marsh Harriers breed in our Island. Being a conspicuous bird, and many years attaining its mature attire, the adult is very rarely found with us. "It is certain that it breeds while yet in the deep chocolate-coloured plumage," which it retains during many of its earlier years. The tail-feathers and secondaries are grey in the adult. "Like the rest of the Harriers its flight is buoyant and sweeping, but generally at a low elevation: it traverses over the moors and marshes in search of its prey, which consists of Frogs, Lizards, Mice, insects, and even fish. The nest is placed on the ground among low bushes or Reeds, generally near the edge of the water: the eggs are four in number, white, and rounded."

BARRED FAUVET, *Curruca nisoria*,—Becfin rayée, *Fr.*—Gesperbter Grasmücke, *G.*—A male of the natural size, and apparently a good figure. We feel pretty well assured that it will be found necessary to institute a new genus for the reception of this species, as no generic group with which we are acquainted in the Warbler family (*Sylviadæ*) could find a place for it. "TEMMINCK informs us that it inhabits bushes and thickets, is abundantly spread throughout the north, occurring in Sweden and in the provinces of the north of Germany and Hungary: it is of more rare occurrence in Austria, and is also found in Lombardy. Its food consists of insects, caterpillars, Worms, and berries. It builds in tufted Hawthorn-bushes, and lays four or five eggs, of a whitish colour, blotched with purplish-ash or pure ash-colour." "The young, before their first moult, have the whole of the body marked with minute transverse rays of ashy brown; irides

* *Ammer* is the German for Bunting, whence our "*Yellow Hammer*," as provincially applied to *E. citrinella*.

brown." Mr. Gould and M. Temminck do not agree as to the amount of difference between the sexes, and we are unable to throw any light on the point, not being acquainted with the species in its native haunts.

Sabine's Snipe, *Scolopax Sabini*, Vigors.—The first specimen of this bird known to have occurred in the British Islands, was killed in Queen's county, Ireland, in Aug., 1822, and was sent the same day to N. A. Vigors, Esq., M.P., D.C.L. Several individuals have since been shot in various parts of Britain. "It is at once distinguished," says Dr. Vigors, "from every other European *Scolopax* by the total absence of white from its plumage, or any of those lighter tints of ferruginous yellow which extend more or less in stripes along the head and back of them all. In this respect it exhibits a strong resemblance to *S. saturata*, from which, however, it differs in general proportions; and I find no description of any other extra-European species which at all approaches it in this character of its plumage. In the number of its tail-feathers, again, which amount to *twelve*, it differs from *S. major*, which has sixteen, and *S. gallinago*, which has fourteen; it agrees, however, in this point with *S. gallinula*; but it can never be confounded with that bird, from the great disproportion between the essential characters of both, the bill alone of *S. Sabini* exceeding that of the latter species by one-third of its length. The tarsi, although stouter than those of *S. gallinago*, fall short of them by $\frac{3}{20}$ths of an inch; they are much weaker, on the other hand, than those of *S. major*, although they nearly equal them in length." Its habits are at present unknown.

Common Snipe, *Scolopax gallinago*,—Bécassine ordinaire, *Fr.*—Beccacino reale, *It.*—Heer Schnepfe, *G.*—This and the preceding species are finely represented, on the same plate; both are males, and of the living size. "Although the contrary has been long recorded by naturalists, we conceive that the natural range of the Common Snipe is comparatively limited, and that the Snipes from India, Africa, and North America, that have been regarded as identical with our bird, will be found to be specifically distinct; in the character of their plumage they are indeed somewhat similar; but they nearly all present a different form in the feathers of the tail, and also a difference of number."

Lanner Falcon, *Falco lanarius*,—Faucon lanier, *Fr.*—Faultless figures of an adult male and a young bird, rather under the natural size. Native habitat the east of Europe and the adjacent parts of Asia and Africa. "It rarely passes further westward than the central parts of the European continent; is scarcely ever seen in France or Holland, and never in Britain." Our author's figures are taken from specimens lent to him by his friend M. Temminck. The Lanner is intermediate between the Jer and Peregrine Falcons, but differs considerably in plumage from both those species. "The young of the year differs from the adult in having the cere and legs blue instead of yellow," &c. While at Vienna

Mr. Gould noticed an individual perfectly reconciled to captivity, "although it is known to be extremely bold and daring in capturing its prey when in a state of nature."

House Sparrow, *Passer domesticus*,*—Grosbec moineau, *Fr.*—Haus Sperling, *G.*—A male and female are figured, in their very best plumage, and truly admirably executed. This bird is extensively distributed over Europe, North Africa, and the hilly districts of India. In *The Naturalist*, Vol. II., the House Sparrow is stated to be comparatively scarce in the neighbourhood of Doncaster.

On the same beautiful plate is figured, in an equally excellent and commendable manner, an adult male of the Tree Sparrow, *Passer arboreus*,—Grosbec friquet, *Fr.*—Feld Sperling, *G.*—"Unlike the preceding species, which loves to dwell in the streets of our towns, this affects the open country, where every field and wood affords it food and a congenial habitat. In the British Islands it is extremely local, being scarcely known in some counties, while in others, Essex, Cambridgeshire, &c., it is tolerably abundant. It is found in most parts of central and southern Europe, and we have received it from the Himalaya mountains and from China. The food consists of seeds, grains, and insects. Like all the other members of the genus, it is devoid of song. The nest is constructed in the holes of stunted trees and pollards, and very closely resembles that of the Common (or House) Sparrow, as do the eggs also, except that they are smaller." There is no sexual difference of plumage. The Tree Sparrow is at once distinguished from the House Sparrow by its small size, by the black patch on its ear-coverts, &c.

Naumann's Thrush, *Turdus Naumannii*,—Merle Naumann, *Fr.*—The representation, of an adult, size of life, is very creditable. This bird, intermediate between the Fieldfare and Redwing Thrushes, is abundant in Japan, but in Europe occurs only, at irregular periods and in small numbers, in the eastern portions. Habits unknown. The female is a trifle smaller and less bright in tint than the other sex.

Mallard Duck, *Anas boschas*,—Canard ordinaire, *Fr.*—Anatra salvatica, *It.*—Gemeine Ente, *G.*—A male and female, rather less than the natural size. As a work of art we should pronounce this plate the *ne plus ultra* of excellence, but there is too much of the character of the tame breed about the drake quite to please the field naturalist. "The range of the Common Wild Duck extends over the whole of the temperate portion of the globe; and although we believe it is scarcely ever found in a wild state south of the equator, its extreme limits approach within a few degrees of the meridian. It is dispersed throughout this

* Our author adopts Cuvier's generic name *Pyrgita*, given solely, we presume, on account of its Greek derivation. We prefer retaining *Passer*.

vast extent of country, and every where shows the same instinct, and the same disposition to become domestic and familiar."

Reed Locustell, *Locustella fluviatilis*.—Becfin riverain, *Fr*.—Fluss Sanger, *G*.—The figure, of an adult male, is much too heavy and sombre, and looks as if engaged in very deep *Betrachtungen!** It is very rare in the west of Europe, but plentiful in Austria and Hungary, and also in the island-gardens in the Danube, near Vienna. In habits, nidification, note, structure, and length of the hind claw, it closely resembles the Sibilous Locustell, *L. sibilans*, of Britain. "Although it resorts to low situations, it does not confine itself to Reed-beds, but rather prefers swampy coppices and thickets." The sexes do not differ.

Redbreasted Goose, *Anser ruficollis*,—Oie à-cou-roux, *Fr*.—Roth-hals Gans, *G*.—A lovely figure of the male, somewhat under the living size. Very rare in Britain, as also on the continent, except in the most north-eastern portions, where it is more plentiful. "The countries to which it habitually resorts are doubtless the extreme northern parts of Asia and Siberia, its migrations in summer extending to the shores of the Frozen Ocean, where it breeds and rears its young." It only approaches temperate climes in extraordinarily severe seasons. The first British specimen we are aware of was killed in 1776; a few others have since been taken, and, says Mr. Stephens, several were captured in the severe winter of 1813, in Cambridgeshire. It agrees in habits with the rest of the genus, with, of course, slight modifications. Feeds on vegetable matters, and its flesh is considered good eating. We imagine, with our author, that the sexual differences of plumage, if any, will be slight.

Honey Pern, *Pernis apivorus*,—Buse bondrée, *Fr*.—Wespen Busard, *G*.—A figure of the bird in the plumage of the first year, with which we cannot find a single objection. Rather sparingly distributed over Europe, including Britain, and occurs also in India. It differs from the Common Buzzard "in possessing a feebler and softer bill, which is wider in the gape, and in having shorter and less powerful tarsi and toes, the claws of which are straighter and less retractile: it may also be distinguished from the members of the genus *Buteo* by the small and closely-set feathers which cover the space between the bill and the eye, which space in all the rest of the *Falconidæ* is either bare or thinly covered with fine hairs or bristles.—Its favourite food appears to be insects, Wasps, Bees, and their larvæ, to which are added Lizards, small birds, Mice, and Moles. It builds in lofty trees, constructing a nest of twigs lined with wool and other soft materials; the eggs are small, of a yellowish white, marked with numerous spots of reddish brown." "Its flight is easy and graceful, and, like its near ally, the Common

* This is a most expressive German word, for which we have no exact analogue in English. It conveys the idea of observation and reflection combined.

Buzzard, its great size readily attracts the notice of the keeper and sportsman, to whom it soon becomes a prey when it takes up its abode in our woods or parks." The sexes do not differ.

Common Nighthern, *Nycticorax Europæus*,—Bihoreau à-manteau-noir, *Fr.*—Sgarza nitticora, *It.*—Nacht Reiher, *G.*—An adult and a young bird, of the natural size, are well figured. Dispersed over the whole of Europe, Asia, and North Africa, and perhaps, also, North America; but it is not certain whether the Nighthems of Europe and America are identical. "In form it is intermediate between the Herons and the Bitterns, and partakes of the habits of both, for although it affects more reedy and secluded situations, it frequently resorts during the day to high trees and woods, where it may be seen perched on the topmost branches. On the approach of evening it retires to the marsh or the river-side, which never fail to afford it a plentiful supply of food: when fish cannot be obtained it feeds upon Frogs, insects, and Mice. It breeds in society, much after the manner of the Common Heron; and constructs a nest, composed entirely of sticks, on the topmost branches of trees, or, where no suitable woods are near its accustomed haunts, among Reeds; the eggs are four in number, of a pale greenish blue." The synonyms of this species, in different stages, are very numerous. Young birds in nestling plumage have no plumes at the back of the head.

Spotted Zapern, *Zapornia porzana*,—Poule-d'eau marouette, *Fr.*—Gallinella sutro, *It.*—Punktiertes Rohrhuhn, *G.*—A very characteristic figure, natural size, of an adult. Abundant in the northern and eastern parts of Europe, the north of Asia, &c., and is a spring visitant with us. The Spotted Zapern and its congeners are strictly aquatic, and although not web-footed, they swim with the greatest facility. "The dense vegetation along the borders of marshes and pools is the situation to which they are particularly attached: they are rarely seen on the wing, and are scarcely ever flushed unless closely pursued by a Dog." "Its nest," says Mr. Selby, "is built among the thick Sedges and Reeds of the marshes, and from the foundation of it being frequently placed in water, is composed of a large mass of decayed leaves interlaced, with the hollow neatly formed, and comfortably lined. The eggs are eight or ten in number, of a yellowish-grey colour, with a tinge of pink, and with round spots of umber-brown of various sizes, and with other secondary colours of a lighter shade. It feeds on Worms, aquatic insects, Slugs, seeds, &c.; and its flesh is sweet and well-flavoured. In autumn it becomes loaded with fat, a layer of nearly a quarter of an inch in thickness covering the whole surface of its body." The sexes and young offer no remarkable differences of plumage.

Meadow Pipit, *Anthus pratensis*,—Pipit farlouse, *Fr.*—Wiesen Pieper, *G.*—A pair of these birds—male and female—are prettily figured, with the exception

of being somewhat constrained in attitude. Distributed throughout Europe; also found in North Africa, and a great part of Asia. Very common with us. "In September and October," observes Mr. Selby, "after their autumnal or general moult, the renewed plumage differs considerably from that laid aside, the green of the upper parts being of a much brighter tint, and the whole of the under parts more deeply tinged with yellow."

Blacktailed Gannet, *Sula melanura*, Temm.—A splendid figure, three-fourths of the natural size. This bird agrees in every respect with the Solan Gannet, except in having a black tail, which is white in the adult of the latter species. The specimen figured was killed in Iceland, and lent to our author by M. Temminck, who believes it to be a true species. Mr. Gould expresses some doubts on the matter; but as the specimen obtained in Iceland is unquestionably fully adult, we feel assured it is distinct from *S. alba*.

Jack Snipe, *Scolopax gallinula*,—Bécassine sourde, *Fr.*—Beccacino minore, *It.*—Moor Schnepfe, *G.*—Very fair representations of two birds, living size. Distributed throughout the marshy districts of England and the continent. Its habits are sufficiently familiar to many of our readers. We must therefore pass on to make way for the—

Mutable Lark,* *Alauda Tartarica*,—Alouette nègre, *Fr.*—The upper figure is one of great beauty. Inhabits the high northern regions of the old Continent, being dispersed over the whole of Siberia, Northern Russia, Lapland, &c. It spreads, in autumn, over the provinces of European Russia, where it sojourns in small flocks. In winter the plumage is much thicker and o a considerably lighter hue than in summer. The female is rather smaller than the male. It is no difficult matter to perceive that this species is out of place among the Larks.

Campsall Park, *Aug.* 1, 1838.

CORRESPONDENCE.

General Remarks on "The Naturalist" and on Natural History.

To the Editor of the Naturalist.

Dear Sir,—Your very friendly notice of my last communication (p. 377) has been the means of bringing a little more trouble upon you in the shape of a few further remarks on one or two more of my pet subjects. Should any part of the present letter be acceptable for some future number of your Journal, pray make

* This is the name employed in the late Dr. Latham's *General Synopsis*.

use of it in any way you please. If not of sufficient import, I beseech you not to occupy its excellent pages with what possibly my vanity, as well as my ardent love for Natural History, has prompted me to send. Were a motive wanting in me to endeavour as far as lies in my power to increase the circulation of *The Naturalist*, your prompt and flattering attention to my poor contribution would have supplied one. But no such lack is in me: its well-chosen subjects form its chief recommendation to every lover of Natural History. No greater zest is requisite to render it a monthly treat to all who "through Nature's works look up to Nature's God," than its well-seasoned pages afford.

With you I exceedingly regret the paucity of "hedge-side strollers" and "Butterfly-hunters," as the many term the few who

> "Wander through the forest walks,
> Beneath th' umbrageous multitude of leaves."

"Few and far between" are the dwellings of the sober-minded naturalist; and yet what spot is there in this our sea-girt island that does not present to the inquiring mind plentiful sources of real pleasure? What season fails to usher in glorious changes in Nature's varied scenes? The months, as they onward glide, offer to our gaze a panoramic view of the Creator's Universe. The rolling year is full of Him who has spread out Nature's ample lap with blossoms bright and fair.

For my own part, I consider the pleasures of rural life to consist less in the boasted freedom from the noise and bustle of crowded cities, than in the quiet enjoyment of the country. The constant watching, as it were, of Nature's varied stores, as they rise from "the death of winter" to the life of loveliness in the opening spring—the vegetable kingdom, from the humble "Daisy pied" to the stern monarch of the forest, especially present a world of delights to him who meditates in the "Book of Nature," ever open—who "sees good in every thing;" and calms his spirit as he contemplates the work of an Almighty hand, displayed not more fully in the perfect development of the giant trees, than in the gentle up-rearing of the fragrant Violet and the tender Grass.

Capture of a Butterfly by a Dragonfly.

While strolling along the margin of the river* the other day, I noticed a singular capture of a Tortoiseshell Butterfly (*Vanessa urticæ*) by one of the very brilliant Dragonflies (*Libellula depressa*). The fierce creature soon overtook and pounced upon its prey, and quickly tore it to pieces on the spot, close to where I was standing. I have often kept the larvæ of the Dragonfly in a glass vase, feeding them on aquatic insects, fresh-water Leeches, &c.

* The river Stoke, we presume.—Ed.

IMPROPRIETY OF WANTONLY SHOOTING BIRDS.

A fine specimen of the Wryneck (*Yunx torquilla*) was shot last week on a Pear-tree, and brought to me, for which I rewarded the bearer with anathemas; for I cannot bring my mind to thank the idle youngsters who thus wantonly destroy our beautiful summer visitants, merely because they are possessed of wings. I verily believe a winged seraph would be considered fair game by these mischievous gunners.

Believe me, with all due apologies for thus intruding upon your attention, to be,

Dear Sir, most respectfully,

Your obedient servant,

Stoke Ferry, Norfolk, RICHARD PIGOTT.
June 15, 1838.

[The remainder of Mr. PIGOTT's interesting letter is alone postponed until we can insert the sketch which accompanies the portion omitted.—ED.]

CHAPTER OF CRITICISM.

To the Editor of The Naturalist.

MY DEAR SIR,—I observe in your July number, that I am unfortunately the subject of animadversion to two of your correspondents; and although I should be sorry to see your pages open to any thing like useless controversy, I hope you will allow me a few words in reply to them.

ON THE FORMATION OF PEARL.

To begin, then, with Mr. LEVISON, who has made some comments (p. 378) on a lecture I delivered before the members of the Doncaster Lyceum, and the first part of which you have published in your Journal (pp. 397—410). I do not recollect the nature of the complimentary remarks made by the Chairman that evening; but at any rate, if what he said induced the audience to believe that I had been conducting any original or elaborate experiments on the formation of Pearl, it was very right of Mr. LEVISON to point out the error. Mr. LEVISON is also right in his letter in adding that on that subject I had not "promulgated any thing new." The theory that I advanced to account for these productions, was, I believe, that of CUVIER; it is that of CARUS; I have heard it advanced by our own great comparative anatomist, GRANT; and it is the one adopted by the author of the able article "*Conchiferæ*" in the *Cyclopædia of Anatomy;* nor do

I see any thing opposed to the validity of this theory in what Mr. LEVISON has advanced. In the first place, Mr. LEVISON, in his remarks, has not fully stated, or has misapprehended, the view I gave in the lecture, of the formation of pearl. I said, that in all cases it was looked upon as the result of secretion depending upon irritation, produced either by a foreign substance—as a particle of sand—being introduced into the shell, or the attacks of some of the boring *Annelides.* (see p. 408). Now the sections that Mr. LEVISON has made "in order to ascertain the *modus operandi*" of Nature in the formation of pearl, confirm this view. If they are formed by a secretion from the mantle, they must present a series of "concentric laminæ beginning with a small nucleus, and enlarging, each successive layer, like a number of watch-glasses, the smallest being the central one." Mr. LEVISON states that, "unfortunately for the theory of the pearls being formed to repair the shell, they are often found imbedded in the flesh of the animal;" it is not, however, asserted that this is the only mode of forming pearls, but that they may be formed around any foreign substance. Still in this case there is some difficulty in accounting for such a situation of the pearl; and I will give the explanation of the phenomenon in the words of DESHAYES. The loose pearls, he observes, "are met with more especially in the substance of the adductor muscles; now if it be remembered that these muscles shift their place in proportion as the animal grows, it may readily enough be allowed that a pediculated pearl, developed on the surface of the muscular impression itself, might be detached from its connection with the shell, by the advance of the muscle, become free in the substance of this muscle, and there continue to increase with more or less rapidity." With regard to Mr. LEVISON's theory of their being formed in a similar manner to *calculi*, there can be no doubt that these bodies are formed by the deposition of successive particles of matter, secreted from the fluids of the animal in which they are found, in the same manner as *calculi;* and it is on this account that they must with those bodies be regarded as diseased productions.

I cannot, however, subscribe to Mr. LEVISON's supposition that these bodies are formed by deposition from a solution of the nacreous portion of the shell. There is no evidence to give the shadow of a probability to such a theory. All analogy in the functions of the Animal Kingdom are opposed to it; and the physical principle on which he builds his hypothesis can never take place in the vital economy.

LINNÆAN AND NATURAL SYSTEMS OF BOTANY.

I must now beg a few lines for your intelligent correspondent Mr. EDWIN LEES, who opened his letter (p. 380) with so warlike an aspect, that I began to tremble for the consequences. However, his kindly feelings appear to have prevailed,

and the fear of "allusion to living authors" seems to have converted his "literary spear" into what he might esteem merely a peaceful pruning-hook.

As Mr. LEES has not attempted to reply to my paper, I shall only remark on what I deem his misapprehensions. He seems to have fallen into the error of supposing that the advocates of the more extensive cultivation of the natural system condemn the system of LINNÆUS *per se;* but nothing can be more erroneous; they can appreciate, and admit in their writings, the simplicity and adaptation of the Linnæan system; they respect and admire its great and philosophic inventor; and are ready to allow that it *has been* a most powerful means of advancing the pursuit of Botany. But this is not the question; it is not who has invented the artificial system? or what has it done? The inquiry ought to be, is it adapted to the requirements of the advanced state of the science of Botany at the present day? This is the question, I think every one will allow, to which attention ought to be directed, and which formed the basis of the remarks I made in your Journal a month or two since (p. 175).

No one was more perfectly aware of the deficiencies of his system than LINNÆUS himself. He asserted, in his writings, that the great end and aim of every botanist must be the arrangement of plants according to their natural relations and affinities. He attempted this great work himself, in his *Fragments of a Natural System;* and there can be little doubt that sincere would be his regret, if he could lift his head from the grave, to see men calling themselves his disciples upholding his imperfect and artificial system as the acme of botanical wisdom.

Mr. LEES has repeated his assertion that the rejection of the Linnæan system by botanists is "unphilosophical." If the endeavour to advance the knowledge of the structure or affinities of plants; to direct the mind to the laws that regulate the distribution of plants over the globe; to enlarge the sphere of botanical knowledge by presenting to the student groups instead of individuals; to exercise the highest powers of observation by a minute attention to structural analogies, be "unphilosophical," then I must admit that botanists, in insisting on the adoption of the natural system and the rejection of the Linnæan, must plead guilty to the charge of Mr. LEES.

But those who admire and advocate the Linnæan should, in fairness, recollect that it is not rejected because it has no merits, but because as a system it has been superseded. The books written to explain that system are condemned because the authors have failed in giving a correct view of the science of Botany. If the system be found easier as a means of analysis, let it be adopted by those who find it so; but those who use it for this purpose, must submit to be told that that is not the ultimate end of Botany; and if they remain satisfied with it, they must submit to the "implication of being trifling and superficial

observers." Would Mr. LEES or any other botanist recommend a student in Chemistry to begin by studying the physica subterranea of BECHER and STAHL, or would he recommend him to commence Zoology by reading ARISTOTLE and PLINY. Would he not much rather put into his hand the chemical treatises of TURNER and THOMSON, and the zoological works of CUVIER and GRANT? If, then, he would adopt such a plan in one science, where is the reason for acting differently in Botany?

Let not, however, Mr. LEES suppose that because he is the advocate of the Linnæan system, I cannot admire the enthusiasm and elevated feeling he throws into his pursuit of science, or that I would wish in the least manner to depreciate or prejudice exertions like his. I feel, in common with him, an anxious wish to extend widely an increased desire for a knowledge of the various branches of Natural History, and feel pleasure in being a fellow-labourer in the same field with such a man as himself; and if I have differed from him in the point under discussion, it has been very far from my wish either to treat him "uncourteously," or in the remarks I have made to act the part of a "flaming partizan." He must also remember that, in this case, I was not the aggressor; and although he might not in his communication (p. 68) have had any intention of provoking discussion, yet I should certainly have passed over his letter uncommented on, had he not made a direct attack on an incidental expression of my own.

I remain,

Yours very sincerely,

EDWIN LANKESTER.

Campsall, near Doncaster,
July 28, 1838.

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

LIVERPOOL NATURAL HISTORY SOCIETY.

July 13.—Mr. T. B. HALL read a short paper on the natural system of Botany, accompanied by some interesting remarks on the geographical distribution of British plants, principally in reference to an intended Flora of the neighbourhood of Liverpool, which Mr. HALL is about to publish (see p. 395). The paper was illustrated by some excellent drawings and synoptical tables of the different natural systems, which were supplied through the kindness of Dr. DICKINSON.

The Society then took into consideration the interesting geological discovery lately made at Storton-hill. The following is an abstract of the information elicited during the discussion:—

Two or three weeks ago the workmen at Storton-hill Quarry, situated about four miles south-west of the Mersey, discovered a large slab of Sandstone, thirty-five feet below the surface of the ground, having upon its lower face a number of casts of feet in high relief, and in a beautiful state of preservation. Several of these have a very close resemblance to the palm of the human hand, and were at first taken by the workmen for casts of that organ. Two sets of feet are visible along the slab and running in the same straight line. One of these sets consists of highly-relieved casts of the hind feet of the animal, and the other of those of the fore feet. The hind feet are nearly nine inches in length by about four in breadth across the toes, and the smaller four inches long and about the same in breadth. The hind feet are plantigrade, and consist of four strong toes, with short stout conical claws on each, and a large thumb bent backward, and apparently without a claw. The toes are rather less than one-half the length of the foot, and the sole appears to have been as well covered with soft parts as a thick hand; and, from the strong marks of muscular development it presents, was evidently intended for grasping. The round muscular prominence at the root of the thumb is very large, as well as that at the root of the fourth toe. The toes appear each to have been formed of three phalanges; and they, as well as the whole sole of the foot, appear to have been covered with a rugose skin, the folds of which are distinctly visible in one of the casts. The fore feet are small in proportion to the hind ones. They are plantigrade, and consist of five separate toes, apparently armed with short claws. The length of the step of the animal has been twenty-two inches, which is the distance between the casts; and in walking the hind feet have come close up to the fore.

We have said that these casts were found thirty-five feet below the surface of the Sandstone. At that depth there exists a thin bed of steatitic clay, varying from the smallest thickness to about one inch and a half. This bed is of considerable extent, and dips towards the Mersey, at an inclination of about one foot in ten, and it runs downwards under that part of the rock that has not been quarried hitherto. It appears to have occupied a tract frequented by several kinds of animals, and to have, in consequence, received the impressions of their feet. These impressions have become filled up with sand, which has been subsequently indurated; and it is the casts taken from these footmarks which are now visible on the slab of stone presented to the Society. The size of the slab, which has been lifted off the clay, is very considerable; it is sixteen feet long by four feet in breadth, and four inches thick; and the track of one animal is visible over its whole length, in a straight line; and in walking the animal has crossed the feet over each other about three inches. This large slab has been broken into three pieces; but there is one of these above seven feet long.

Besides the track alluded to there are casts of the feet of other animals, appar-

ently of the same species, crossing the stone in different directions; and several casts of the feet of a reptile are also visible.

The rock consists of a member of the New Red Sandstone series; and it is a fact worthy of notice, that the only other impressions of this same animal that have hitherto been discovered exist also in the New Red Sandstone of Hilburghausen, in Saxony, and, what is remarkable, they are accompanied by the footmarks, apparently, of the same reptile which has left its traces in the stone at Storton-hill. The slab bearing these footmarks is now in the British Museum, and a particular account of them has been given by Prof. BUCKLAND, in his *Bridgewater Treatise*. They were first noticed by Prof. KAUP, who gave the animal which made them the name *Chirotherium*, which we shall retain, and he placed it among the *Marsupialia*. In this specimen the footmarks are only sixteen inches distant from each other, while in that before the Society they are twenty-two inches, showing a great difference in the size of the two animals.

This animal, of which we have no remains but the impressions of its feet, appears to have belonged to the order *Marsupialia*. The hind feet bear a stronger resemblance to those of the animals of this family than to any other; and, indeed, they look somewhat like enlarged models of one of the species—*Didelphis Virginiana*. In some respects the animal seems to have been allied to the Opossums, though in others it appears to have approximated to the Kangaroos, especially in shape. This is deducible from the disproportionate size of the feet. The hind feet are large and strong, and show that the back part of the animal was very large and heavy; while the comparatively small size of the fore feet seems to indicate that the head, neck, and chest were small and light—or, in other words, the animal appears to have been of a conical shape, and in this respect approximating to the Kangaroo tribe, although differing widely from it in the structure of its hind feet, which, as we have already stated, bear a resemblance to those of *Didelphis* (the Opossum). There are, also, two other points of difference deducible from the footmarks of this animal, namely, that its fore legs were long and slender, and that it had no tail for leaping. The first of these appears from the fact that the length of the step of the fore feet is exactly that of the hind feet—to wit, twenty-two inches—which is as large as the step of a Cow; and the fact of the absence of a leaping tail is shown by the non-occurrence of any mark on the stone which could indicate its presence, and which would probably have been the case if it had existed. In both these respects the animal has differed from the Kangaroo. There are many strong points of difference between the characters of *Chirotherium* and those of the other genera of the order *Marsupialia*; so that taking all the circumstances in connexion, it may perhaps have occupied a place between the genera *Didelphis* and *Kangurus*—resembling the former in the structure of its hind feet, and the latter in the shape of its

body and its slender fore legs; but in a subject beset with such difficulties nothing very positive can be determined. In estimating the size of *Chirotherium* we have no means of comparison except those furnished by known genera. The present species of *Didelphis* are comparatively small, whereas this animal appears to have been of gigantic size. The Virginian Opossum, to which it seems to have approximated most closely in the structure of its feet, is about twelve inches long, and its foot is about one inch in length; while in the animal before us we find the hind feet nine times that length, and the body was probably of a proportionate size. If we take this as our standard, we should have an animal about four feet high, and six or seven feet in length, probably with a long prehensile tail, nearly the length of the body. And this size will agree very closely with all that we know of the gigantic scale on which the inhabitants of the old world were constructed. Pursuing the investigation still further, we find that the opposable thumb of the hind foot is intended to fit the Opossum tribe for scaling trees, in search of food, and to find a place of repose; and when we conceive an animal of the magnitude laid down possessed of the same habits, it affords us a new evidence of the enormous size of those vegetable productions which must have been necessary to support such a weight on their branches, and which were formerly natives of these regions.

In the course of the evening a large drawing of the supposed restoration of the animal was exhibited.

Since the meeting of the Society several new and interesting facts have been discovered; these will be embodied in a report, with illustrative engravings, which the Society is about to publish.

BOTANICAL SOCIETY.

July 6.—J. E. Gray, Esq., F.R.S., Pres., in the chair.—The Secretary read a paper from R. H. Schomburgk, Esq. (dated Curassawaka, Lower Prussunung, Feb. 22, 1838), "On *Bertholletia excelsa*," a tree of the first size. The trunk is straight, the bark deeply furrowed, and of a dark grey colour; it reaches to the height of from ninety to a hundred feet before it divides into spreading alternate branches. The locuments which the green fruit possesses are only thin membranous bodies, scarcely to be recognized when it has come to maturity. The nuts are placed around the quadrangular spermaphorunæ, in four rows, one over the other. There are generally from twenty to twenty-four nuts—seldom more. Many are opened by Monkeys, Peccarys, and other animals, who appear to be very fond of them. The bark is easily separable, like all *Lecythideæ*, and the liber is beaten by the Indians into a mass, which they use in lieu of tinder. The wood is bitter, soft, and inside generally hollow. The Canbees call the fruit and tree *Batonka*, the Wapishanas *Menga*, and the Macousis *Imprema*. The paper

was accompanied by drawings sent to the Society by Mr. SCHOMBURGK.—Mr. JOHNSON, V.P., exhibited specimens of the rarer British plants; and Mr. D. COOPER exhibited specime s of *Cynoglossum sylvaticum*, from Mickleham, Surrey.

CHAPTER OF MISCELLANIES.

ZOOLOGY.

THE CAPELIN (*Mallotus Grœnlandicus*, CUV.—In *The Naturalist* for August you refer (p. 437) to a fish brought from Iceland by Mr. PROCTOR. I had two specimens put into my hands; and if your specimen is the same as mine, it is the Capelin of authors, *Mallotus Grœnlandicus* of CUVIER'S *Règne Animal*, Vol. II., p. 305, edit. of 1829, *Salmo Grœnlandicus* of BLOCH, plate 381. No true Herring has a second dorsal fin, either rayless or rayed.—WILLIAM YARRELL, *London*, *Aug.* 4, 1828.

BOTANY.

LOCALITIES OF PLANTS IN THE NEIGHBOURHOOD OF LIVERPOOL.—The following list of plants, extracted from WITHERING'S *Botany* (ed. 1830) I send for the purpose of obtaining confirmation of such localities as may have been noticed by any of your subscribers; those marked with an asterisk may be presumed to be extinct, as my friend Mr. TUDOR, who has diligently examined the Botany of the north shore of Liverpool, does not now find them in the localities mentioned, which may easily be accounted for, when the great alterations and improvements which have taken place within the last few years in the neighbourhood of Liverpool, are considered. They were inserted by Dr. WITHERING on the authority of Dr. BOSTOCK, who formerly resided in Liverpool, and of the late Mr. SHEPHERD.

* *Pinguicula vulgaris*, Crosby Marsh. Dr. B.—* *Utricularia minor*, Sparingly near Bootle, and Little Crosby. Dr. B. May not *U. vulgaris* have been mistaken for this, as it is found in that neighbourhood?—*Ophrys spiralis*, Allerton, and woods at Ince. Dr. B.—*Crocus nudiflorus*. One mile and a half from Liverpool on the road to Allerton. S.—* *Schœnus compressus*. Bootle, north shore. Dr. B. Is it possible that *S. rufus* has been mistaken for it, as it is found about there? See Vol I. of the *New Botanists' Guide*, p. 303.—*Carex intermedia*, and *C. pilulifera*. The Park. Dr. B. I suppose Toxteth Park, now built upon.—*Littorella lacustris*. Crosby Marsh. Dr. B. I have not put an asterisk against this, as Mr. SHEPHERD, the present curator of the Botanic Gardens, told me it

grew there, but I am doubtful if it can now be found there.—*Vinca minor.* Toxteth Park, and in profusion at the Nut Woods, near Hale. Dr. B. I should doubt if it was really wild in the first-mentioned locality.—*Statice limonium.* Garston. Dr. B.—*Narcissus pseudo-narcissus.* Bank Hall. Dr. B. Mr. Tudor says this is a very suspicious locality, and that it has the appearance of once being a garden.—*Chrysosplenium oppositifolium.* Gateacre. Dr. B.—*Cotyledon umbilicus.* On old walls about Liverpool. Dr. B.—*Sedum villosum.* Bootle. Mr. James Roscoe.—*Rosa tomentosa.* Bootle. S.—*Nuphar lutea.* In the river Alt, by Formby. S. This I have never seen in the neighbourhood of Liverpool, or in Cheshire, though the White Water-lily (*N. alba.*) is very common.—* *Ranunculus parviflorus.* Bootle. Dr. B. Crosby. S.—*Orobanche major.* Near Allerton Hall, on the road to Liverpool. R. Roscoe.—* *Geranium sanguineum.* Sand hills, north shore. Dr. B.—* *Trifolium scabrum.* Tide Milldam. Dr. B. This is destroyed.—T. B. Hall, *Woodside, Liverpool, May* 4, 1838.

Clinopodium vulgare.—At p. 27 of *The Naturalist*, I stated that *Clinopodium vulgare* was mentioned in the *New Botanists' Guide*, but I find that it is an error on my part, as it is not mentioned there. I discovered my mistake on reading Mr. Watson's *Geography of British Plants*, where it is included in the catalogue of species occurring in twelve local floras, and consequently excluded by Mr. Watson's test.—*Id.*

Possibility of cultivating Tea in Northern Countries.—In a letter from the Abbé Voisin to M. Stanislas Julien, we find a statement which proves that the Tea-tree may be cultivated in our northern climates. The former has resided twelve years in China, near the frontiers of Thibet, in which country all the species of Tea are successfully cultivated in the plains, as well as on the mountains; although the degree of cold there much exceeds that of our winters, and the snow never melts before the end of April. Twenty-four treatises concerning Tea have been composed in China from the seventh century to the present time, and which contain all the requisite instructions for the culture and preparation of this plant, and which will be translated by M. Voisin, if required in Europe.—*Athenæum, May* 26, 1838.

Cultivation of Vanilla in France.—M. Charles Morren has succeeded in raising the Vanilla in France, and making it produce fruit. He placed the plants in Coke, strewn with the remains of rotten Willow-wood. In this situation the same plant bears fruit only every alternate year, and twelve months elapse between the fecundation of the flower and the maturity of the fruit.—*Id.*

Power of Lightning.—A very fine Oak-tree, in the park of the Duke of Buckingham, was shivered into shreds by lightning, lately; every particle of the outer bark was torn off the trunk and larger branches, and scattered to a distance of sixty yards from the tree. The fibres of the wood itself were separated into

fragments like thread. A Partridge was found dead within forty yards of the trunk, and had evidently been killed by the explosion.—*Star in the East, July* 14, 1838.

Ancient Oak.—Few connected with Monmouthshire are unacquainted with the celebrated Gelynos Oak, near Newport, the contents of which were upwards of *forty-eight* tons! Probably few are acquainted with the Cæ Rheidr Oak standing above the river Usk, about two miles from Cærleon, on Pencreeg farm, the property of Colonel Mackworth. This most venerable and gigantic Oak-tree, which has been lithographed, is very much of the same description as that at Gelynos, and probably nearly as old, and of little less dimensions. They who take a pilgrimage to the old Roman ground of the *Isca Silurum*, and the ancient mansion of the accomplished Lord Herbert, of Cherbury, at St. Julian's, should extend their walk two miles further, to Llanhennock Church, near which they will find this magnificent surviver.—*Merthyr Guardian.*

GEOLOGY.

Submarine Volcano.—On the 25th of last November, the Captain and passengers of the brig *Cæsar*, from Havre, on passing the bank of Bahama, saw an enormous fire, which increased till it had tinged the whole of the sky and part of the horizon. It was kept in sight for four hours, and could only be accounted for as proceeding from a submarine volcano. On the 3rd of January, the Captain of the *Sylphide*, also from Havre, being on the same spot, found the sea disturbed, and whitish in colour, which he attributed to the same cause. To these notices, conveyed to the French Academy of Sciences, M. Moreau de Jonnés adds, that on the 30th of the same November, an earthquake took place at Martinique. The shock was violent, and the heat very great.—*Athenæum, May* 12, 1838.

New Fossils.—The indefatigable M. Lartet continues his researches, and fresh discoveries will now enable naturalists to complete the osteology of the Dog called *Amphicyon*. The half of another jaw of a Monkey has also been discovered.—*Id.*

Colossal Remains.—A Wiltshire paper states, that within these few days some remains of a huge animal, to all appearance of the Ox kind, had been discovered in the Avon, at Melksham. In casting a net it became entangled in a deep pool, and after getting clear, brought up an immense horn. This led to further search, and after much trouble the skull and the other horn were brought up. The horns are stated to be finely formed, 39 inches in length, $17\frac{1}{2}$ inches in circumference near the base, and separated in the skull by 12 inches. A rib of corresponding size has since been fished up. How long they have been in the water it is impossible of course to conjecture, but appearances, it is said, indicate that it must have been centuries.

REVIEWS OF NEW PUBLICATIONS.

The Connexion of Natural and Divine Truth; or, the Study of the Inductive Philosophy considered as subservient to Theology. By the Rev. Baden Powell, M.A., F.R.S., F.G.S., of Oriel College, Savilian Professor of Geometry in the University of Oxford. London: *John W. Parker*, West Strand. 1838. 8vo. pp. 313.

This volume reached us some months ago; our notice of it has not been thus long delayed because it emanates from the pen of a Rev. Oxford Professor, and because it must therefore be "flat, stale, and unprofitable," but because, in spite of its birth-place, it appears to us a model of sound unpretending liberality, and hence demands a careful perusal. The Rev. Prof. Powell, M.A., is fully aware of his "grievous heresies," but testifies no false alarm at the thoughts of publishing them to the world. He relies on Man's natural love of truth too confidently and too justly to believe that the promulgation of it will be a cause of alarm. If he errs, it is an error of judgment and not of intention. To blame any one for his opinion is really very ridiculous. For instance, some one conscientiously believes that there is no God: we consider that he is mistaken, and endeavour to convince him of it; but never can we *blame* him for boldly declaring his belief. It would be time enough to blame him when, disbelieving the existence of the Deity, he should, from whatever motive, attempt to maintain an opposite opinion in the face of the world. Let no one think himself liberal or charitable so long as he can confer the epithets "atheist," "infidel," &c., as terms of contempt. We are none of us infallible; and in a point shrouded in the utmost perplexity to the deepest thinker, it is possible the "atheist" may be right. Let us no longer discuss these high, these difficult subjects with fear. If the world be really governed by one Almighty Power—which we firmly believe—the more the point is investigated, the more likely shall we be to arrive at the truth; but if we shrink from reason through fear of upsetting favourite theories, where is our safeguard? If, again, the Scriptures are directly inspired—if the "Song of Solomon" (a love-song which, published in any modern novel, would be denounced immoral), the writings of Moses, and the Epistles, are alike the immediate emanations of God's boundless wisdom, fear not that the employment of our reason will weaken our respect for them. Did God give us our highest faculties in order that they should lie dormant, be termed "proud," "vain," and never be exercised to decipher His noble works? That the majority of our spiritual advisers think thus is very clear—that our author is of an entirely opposite opinion, we are happy to find. To prove that the preachings and the practice of

the former are at variance with each other, and that neither, taken separately, is in accordance with reason, but merely in obedience to blind impulses, were no difficult matter; but space, and a sincere desire to do our author some kind of justice, as well as the objects of our Journal, forbid it.

Our author divides his book into the following sections:—1. the evidence of physical truth; 2. the nature of physical truth; 3. the relation of physical truth to Natural Theology; 4. the relation of Physical Science and of Natural Theology to Revelation. The subject is so extensive, that we shall select one section for consideration, and briefly glance at some of its principal contents. It shall be the fourth, as there, we find, we have made the greatest number of marks on perusal.

Natural Theology, says Prof. POWELL, is decried at one time as weak; at another, as dangerous; despised by those ignorant of its nature, and "dreaded by those who tremble at the dawn of truth and free inquiry, for their dogmas, whether of atheism, fanaticism, or orthodoxy." (p. 218.) The history of past ages supplies us with familiar examples of this position. And although the particular points which now agitate the world are different from what they then were, the grand question still is, "whether we are to adhere to the letter of Scriptural representation in opposition to the testimony of inductive research, or whether it is safe, rational, or consistent with an enlightened and well-grounded faith, to stake the reception or rejection of Christianity on the credit of these particular expressions." (p. 236.) Mr. POWELL believes Scripture to be inspired, but that, seeing the contradictory nature of many of its own statements, and of these compared with the results of modern science, it is absolutely necessary to test the whole of the Bible by reason and experience. Alluding to the Mosaic account of the creation, he says:—

"From the time of MOSES downwards, no one has ever imagined the secret meaning of the description to the present day, and, when disclosed, it affords no instruction, since it cannot be so much as understood till the facts have been learnt from geological study, and when they have been, it is superfluous."—p. 249.

For a nearly similar opinion of our own see our present volume, p. 444.—The claims of the Bible on our attention, justly observes our author, must rest on natural-theological testimony; he adds, that those who would construct systems of philosophy from the Bible, and "the Bible-geologists of the present day, who attempt to force its language into accordance with philosophical results," pursue this "mistaken principle of reasoning," and "make revelation the guide to philosophy." (p. 238.) These gentlemen build their houses upon the sand, and fail to anticipate the consequences. "Scriptural Geology is as preposterous in principle as statutable Geometry. By the same rule we ought to criticise Poetry on the

grounds of Metaphysics; and establish the processes of Chemistry by the precepts of Rhetoric." (p. 240.)

"Too many nominal Christians entertain only the most miserable idea of the nature of the gospel they profess to believe; their only notion consists in a confused general impression of a certain sacredness in Scripture," which causes them to be alarmed lest its sanctity should be invaded either by themselves or by others. "Adopting their creed blindly from education, too many hold their religion by a most loose and uncertain tenure, and are so lamentably confused in their notions of its nature, that they dread a formidable shock to Christianity in every physical discovery" (p. 242.), as though, if the Bible *were* infallible, a knowledge of God's works would bring proof of the falsity of His word. "There are some who join most vehemently in the cry against science in general, and Geology in particular, as dangerous to religion, *upon no sincere grounds of religious* conviction." (p. 244.) We may add, there are many who, professing to believe Geology, refuse to receive its results save where they square with preconceived notions: these, too, have not, necessarily, any sincere religious conviction for their basis. But far greater is the number of those who, comprehending neither Bible nor Science, uphold the one because sanctioned by education, party, or custom, and reject the other upon grounds equally rational. "The one party seeking to support religion by the propagation of falsehood, the other by the suppression of truth, both agree in treating truth as if it were falsehood, and thus give its enemies the fairest ground to think it so." (p. 245.)

Still considering Science in relation to the first chapter of Genesis, Mr. POWELL remarks:—

> "It is matter of sincere regret still to see some excellent writers keeping up this temporizing system, when it would be so much more worthy a course boldly to front the difficulty, and avow the contradiction in plain terms; but instead of this, we observe them exerting their utmost ingenuity to elude the contradictions, either by disguising the *facts*, or glossing over the *words* with the most flimsy interpretations. * * * The subject, when simply and calmly considered, is plain, and hardly open to misapprehension; but men cannot be brought to consider it simply and calmly."—p. 247.

After discussing more minutely the Geology of MOSES, and the various interpretations it has received, Prof. POWELL concludes the chapter by "assuming that the inquirer and interpreter are both sincere seekers of truth." (p. 253.) Is it, then, possible that those who profess to obtain their morality from the Bible, and who believe that the Bible is inspired, can need to be reminded that they *ought to be* lovers of truth? Alas! they have yet to learn that what is true is of God, and must, therefore, be beneficial.

Our author distinctly allows the falsity of the Mosaic account; but at the same time he attempts to justify it, on the score of "adaptation to the ideas of the

Jews." We cannot agree with him on this point, thinking as we do that the anticipation of ultimate truth can never justify even the temporary promulgation of falsehood. Is it that truth in general can best be arrived at by factitious means; or that this falsehood of MOSES in particular has so greatly promoted the cause of truth during a period of eighteen hundred years? These expedients, fortunately, on whatever authority based, cannot produce *permanent* evil. But the lapse of centuries is often necessary to dispel a single error, when supported by bigotry and apparent interest.

Prof. POWELL then proceeds to observe that "to those whose views are such as to amalgamate all the different parts of the Bible into one, a difficulty found in one part will assume the character of an objection to all other parts, and seriously endanger the stability of the whole." (p. 265.) That the discovery of an error in one part does not prove the falsity of the whole, either in the Bible or any other book, we perfectly agree with our author; but it obviously and at once deprives the volume of its supposed infallibility.

But we must here, unfortunately, close our difficult and tantalizing task. Were we to impart a satisfactory idea of this work to our readers, it would be by presenting them with a copy of the volume itself. Rarely have we met with a book so truly candid, so logical, and so clear; but our pleasure increases ten-fold when we consider the sect, profession, and titles of our author. Nominally he belongs to the Church of England—actually he upholds no creed, sect, or party. Add to this his extensive knowledge and reading, and we at once admit him to be ably competent to the composition of such a work.

But we must not part without a word to the Oxonians. Either the worthy inhabitants of the time-honoured city must have been firmly locked in the arms of Somnus when they suffered the elevation of such a man as Professor POWELL to enter the chair of Geometry in their hallowed University, or else they elected him wholly ignorant of his religious opinions, and his unconditional devotion to truth. Will he be suffered to retain his dignity after writing such a book?

To the public generally we would respectfully hint, that it were indeed *the* "eighth wonder of the world" should it so happen that the rest of mankind is alarmed at the uncompromising liberality and love of reason displayed by a Reverend Professor, A.M., in the University of Oxford.

LITERARY INTELLIGENCE.

WE understand that the thirty-seventh number of HEWITSON'S *British Oology*, completing that beautiful and accurate work, has been published.—It gives us pleasure to announce the appearance of a second edition of Dr. MANTELL'S *Wonders of Geology*.

PORTRAITS, MEMOIRS, AND AUTOGRAPHS OF LIVING AND RECENTLY-DECEASED NATURALISTS, BRITISH AND FOREIGN.

We have long had in contemplation a series of the above nature, and have at length so far completed our arrangements as to be enabled to announce the appearance, in our next number, of a portrait, memoir, and autograph of the late Dr. Latham, celebrated as an ornithologist wherever Natural History is a study. The consent of several eminent naturalists to appear in "The Naturalist's Portrait Gallery," has likewise already been obtained, so that there will be no interruption in the series. We flatter ourselves it will be admitted that no difficulties, however great, have been allowed to hinder the performance of any plan proposed by the present Editor, relative to *The Naturalist.* This ought to assure us some confidence for the future. But at the same time our readers may desire definite information respecting the proposed addition.

It may, then, be observed that a portrait will be issued every alternate month, without any advance in price, and without interfering with the necessary illustrations in Natural History. Further, let it be distinctly understood, that no commercial speculation is intended; but that the plan, having appeared desirable to ourselves, and having received the approbation of many present subscribers, as well as of several who on that account intend to become subscribers, we have no hesitation in commencing it.

Our subjects will in most cases be living naturalists, but a few exceptions will be made in favour of those who have recently quitted the world. In almost every instance the portraits will be original. Thus when an indifferent portrait of any individual is already on paper, we should on no account republish it on the score of economy, but would either take an improved copy from it, or procure an altogether fresh likeness. There are, for example, portraits of Audubon, Wilson, Kirby, &c., before the world; but they are both mediocre in execution, and scarcely known out of London, except where they are inserted as frontispieces to the authors' own works.

A memoir will in every possible case accompany the portrait, and will consist either of a memoir of the life of the individual, and of a notice of his scientific labours and official stations, or of the latter only.

Thirdly, an autograph will appear with the portrait.

Our aim, therefore, is to render the public more intimately acquainted with the labours and lives of those individuals whose exertions have best answered the ends of Natural Science; and it is anticipated that at the close almost every name of eminence will be included. The series will comprise scientific naturalists, popular naturalists, and patrons of Natural History; but of course no "artificial classification" will be attempted in the execution of the plan.

In fine, the series itself will best testify to the manner in which our views, here briefly stated, will be carried out.

Campsall Hall, near Doncaster, Aug. 15, 1838.

END OF THE THIRD VOLUME.

INDEX.

ORIGINAL PAPERS.

CORRESPONDENCE.

CHAPTER OF CRITICISM.

PROCEEDINGS OF NATURAL HISTORY SOCIETIES.

EXTRACTS FROM THE FOREIGN PERIODICALS.

CHAPTER OF MISCELLANIES.

REVIEWS OF NEW PUBLICATIONS.

LITERARY INTELLIGENCE.

OBITUARY.

EXTRA.

LIST OF ENGRAVINGS.

LIST OF CONTRIBUTORS.

ERRATA.

P. 3, l. 8, for "*Damara*" read *Dammara*.—P. 3, l. 9, for "*Melicytis*," *Melicytus*.—P. 3, l. 11 from bottom, for "*Adeantum*," *Adiantum*.—P. 3, l. 3 f. b., for "*Agara*," *Agavia*.—P. 3, l. 2 f. b., for *Arraearia*," *Araucaria*.—P. 3, l. 2 f. b., for "*Psedium*," *Pselium*.—P. 4, l. 2 f. b., for "43°," 48°.—P. 5, l. 2, for "*ten*," *two*.—P. 15, l. 6, for "*pinniperda*," *piniperda*.—*Passim*, for "*Mr. Benshed*," *Mr. Bensted*.—P. 27, l. 1, for "*aryophyllum*," *caryophyllum*.—P. 27, l. 3, for "*bitalba*," *vitalba*.—P. 27, l. 7, for "*Fielvedon*," *Kelvedon*.—P. 37, l. 2 f. b., for "*Hippotami*," *Hippopotami*.—P. 48, l. 26, for "*Coleoptera*," *Insects*.—P. 52, l. 7, for "*Colombus*," *Columbus*.—P. 60, l. 1, dele "*that*."—P. 63, l. 26, for "*or*," *on*.—P. 87, l. 8 f. b., for "*Geotrupus*," *Geotrupes*.—P. 92, l. 8, dele "*an*."—P. 98, l. 3 f. b., for "*special*," *specifical*.—P. 106, l. 17, for "*papillary*," *capillary*.—P. 111, l. 16, for "*shyness*," *slyness*.—P. 130, l. 3, for "*unequivooal*," *equivocal*.—P. 138, l. 28, for "*aeuata*," *arcuata*.—P. 138, l. 29, for "*Acule*," *Acute*.—P. 139, l. 8, for "*tinnuneuls*," *tinnunculus*.—P. 140, l. 23, for "*Saxus*," *Taxus*.—P. 140, l. 24, for "*Thraspi bulsa-pastoris*," *Thlaspi bursa-pastoris*.—P. 164, l. 9 f. b., for "*aceuraey*," *inaccuracy*.—P. 190, l. 9 f. b., for "*Clyn Carns*," *Llyn Cwm*.—P. 191, l. 6, for "*Idwat*," *Idwal*.—P. 192, l. 4 f. b., for "*struts*," *blocks*.—P. 192, l. 2 f. b., for "*flask*," *flash*.—P. 192, last l., dele "*but*."—P. 193, l. 10, for "*cwmry*," *cwmry*.—P. 215, l. 12, for "*dromadarius*," *dromedarius*.—P. 221, l. 6 f. b., for "*mealden*," *Wealden*.—P. 238, l. 14, dele "*but*."—P. 426, l. 13 f. b., for "*Cureulioniдæ*," *Curculionidæ*.—P. 252, l. 5, for "*tentrandrum*," *tetrandrum*.—P. 277, l. 6, for "*Casteropoda*", *Gasteropoda*.—P. 335, l. 9, for "*land, animals*," *land-animals*.—P. 367, l. 12, for "*unpleasing*," *upheaving*.—P. 371, l. 9, for "*Chaddach*," *Cwddach*.—P. 371, l. 6 f.b., for "*Empetrum nigrum*," *Epipactis latifolia*.—P. 390, l. 4, for "*Pentemera*," *Petamera*.—P. 403, l. 1, for "*or*," *for*.—P. 404, l. 11 f. b., after "*however*" insert *not*.—P. 438, l. 26, for "*ovata*," *obtusa*.—P. 449, l. 9 f. b., for "*principle*," *principal*.—P. 467, l. 11, for "*influence*," *inference*.—P. 504, after Dale, Jas. Chas., Esq., for "100," 109: after Glover, Thos., for "422," 322.